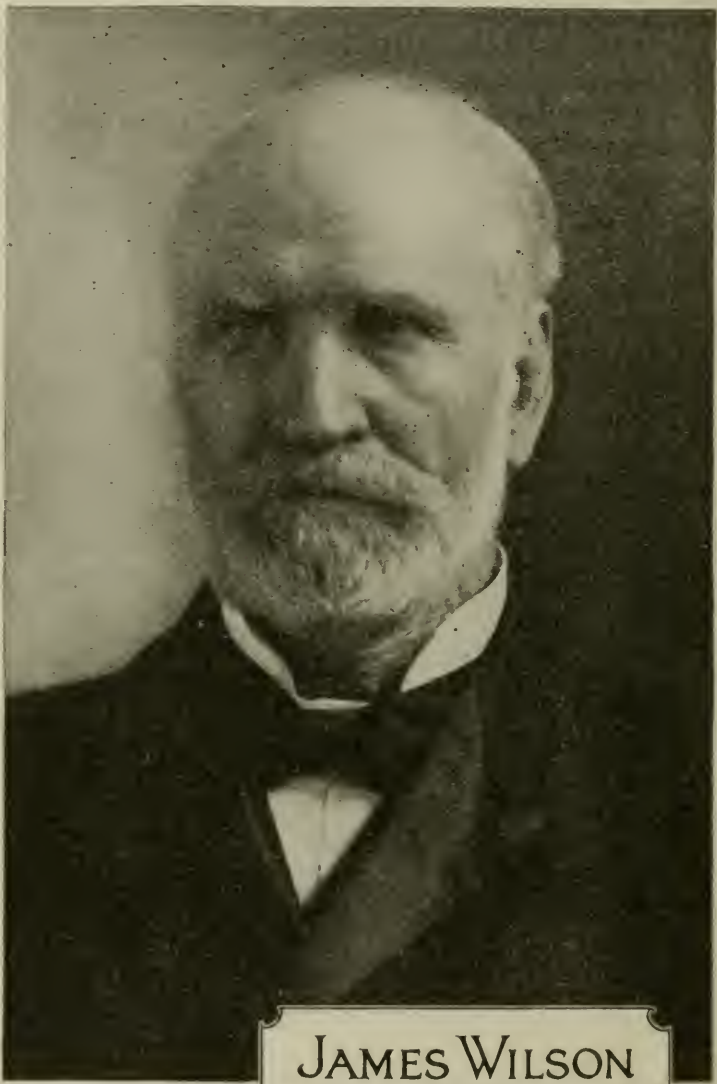
UNITED STATES DEPARTMENT of AGRICULTURE

YEAR BOOK 1920



JAMES WILSON

Secretary of Agriculture

1897 - 1913

Born August 16, 1835 - Died August 26, 1920

UNITED STATES
DEPARTMENT OF AGRICULTURE

YEARBOOK 1920

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MORE COMPLETE KNOWLEDGE.

AS A NATION we have always stood on our own feet and felt ourselves masters of our own destiny. Our immense and varied natural resources have enabled us to maintain this position and have justified this feeling. It is largely because of our confidence in the sufficiency and permanency of these resources that we have been in the past and are now able to look the future calmly in the eye and go on our way steadily improving the quality of our national life. We have always been able to look beyond the frontier of cultivation to new and untouched fields ready to supply the landless farmer with a homestead and to meet the growing demands of the country for food, clothing, and shelter. That untouched reserve has about disappeared. We have another reserve, however, as vast as that which lay before the pioneers in the old days. It is the grain and meat, the wool and the wood, the thousand and one other products of field and forest that we can add to our store by applying more intensively on the farm and in the forest the scientific principles and methods that come forth from laboratory, sample plot, and experimental farm. As the days go by we learn more and more the underlying causes of success in agriculture, we perfect methods for applying the new discoveries, we reduce more and more the element of chance and guesswork, we grow in knowledge of how to get more and better crops from the land and how to market them where they will do the most good. The answer to the problem of both producer and consumer lies in the extension of our efforts in these directions, in the use and distribution of what we have on the basis of more complete knowledge, and in putting the idle land to work and making all the land work to better purpose. In times of short crops the chief concern is whether production can be stimulated sufficiently to supply the nation's needs; when the crop is long, marketing becomes the paramount question. Temporary causes for these conditions and temporary remedies to meet the crises produced will probably never be eliminated. In the long run, however, more complete knowledge of production and marketing, emanating from scientific and unbiased agencies, will go a long way toward solving the problems of producer and consumer alike. The key with which to open the door to better conditions may take any one of a number of forms, but it must be cast chiefly from the metal of Agricultural Science

L. C. Everard.

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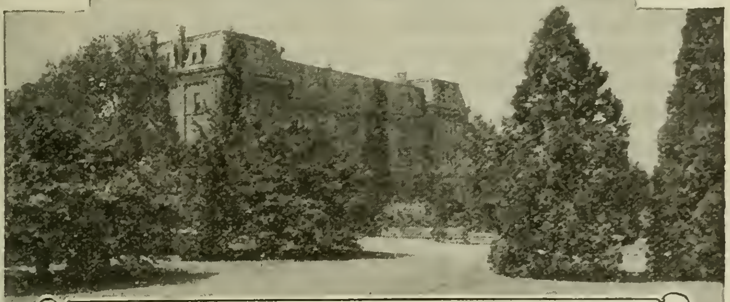

THE YEAR IN AGRICULTURE

THE SECRETARY'S REPORT TO THE PRESIDENT

WASHINGTON, D. C., *November 15, 1920.*

SIR: The farmers of America have again justified the faith of the Nation in their ability to meet its requirements of food, feed, and raw materials for clothing. They have produced this year, in the face of enormous difficulties, the largest harvest in the history of American agriculture, with a single exception. The combined yield of the 10 principal crops is 13 per cent above the average for the five years preceding the outbreak of the World War.

The corn crop of 3,199,000,000 bushels is unprecedented, representing more than four-fifths of the world's production. The sweet-potato crop of 106,000,000 bushels is the largest ever produced and far in excess of that of any other year except 1919. The rice crop of 52,000,000 bushels is one-fourth greater than the largest crop ever before harvested. The tobacco crop of 1,476,000,000 pounds considerably exceeds any previous yield. The sugar-beet crop is more than one-third larger than the largest ever before recorded. The grain sorghum crop of 149,000,000 bushels is 18 per cent above that of 1919, which was itself a record crop. The potato crop of 421,000,000 bushels has been exceeded only once, and then by a very narrow margin. The oat crop of 1,444,000,000 bushels has been exceeded only three times, and the tame hay crop of 88,000,000 tons only twice. The apple crop of 236,000,000 bushels has been exceeded only once, in

1914. The yields of wheat, barley, buckwheat, peaches, peanuts, edible dried beans, flaxseed, and cotton are slightly below the average, but they, nevertheless, represent an enormous volume in the aggregate. The number of all classes of live stock on farms, although less than the number in 1919, exceeds by 18,214,000 the average for the five years preceding the outbreak of the European war.

Many Obstacles Encountered.

These remarkable results were achieved under conditions which were decidedly disheartening at planting time. The farmers were confronted with an unusual number of obstacles, and many of them were formidable. The spring was late and cold and wet, threatening to restrict the crop acreage and making it uncertain whether seed would rot in the ground or whether those which germinated would reach maturity. In only 4 years of the last 37 was the progress of plowing, up to May 1, so backward as in 1920. With this initial handicap and with the prevailing uncertainty regarding weather conditions during the growing season, the farmers were discouraged. They saw no hope of a reduction in the prices of fertilizers, machinery, and supplies, which had increased greatly since 1914. In addition, the labor supply was approximately 37 per cent short, and wages had risen to such a point in 1919 that the farmers were appalled at the thought of paying still higher wages in 1920. Many of the men who entered the military and naval services and war industries did not return to farm work. Wages in all industries, in trade and in transportation, increased so rapidly that their lure became irresistible to many laborers who had thus far remained on the farm, and they, too, were carried with the current to urban centers. Altogether, in the spring of 1920 the American farmers were confronted with the most difficult situation they had ever experienced.

The accompanying tables show at a glance the results of the year's agricultural operations, so far as the statistics are availble, and indicate also the extent to which farm products have entered into our foreign trade.

Average of crops in the United States.

[Figures refer to planted acreage for winter wheat and rye.]

Crop.	1920 (unrevised estimate, October, 1920).	1919 (subject to revision).[1]	1918	1917	1916	1915	1914	Annual average, 1910-1914.
CEREALS.								
Corn	103,648,000	102,075,000	104,467,000	116,730,000	105,296,000	106,197,000	103,435,000	105,240,000
Wheat	53,652,000	73,827,000	64,352,000	58,366,000	56,810,000	62,042,000	54,661,000	52,452,000
Oats	41,032,000	42,400,000	44,349,000	43,553,000	41,527,000	40,996,000	38,442,000	38,014,000
Barley	7,437,000	7,420,000	9,740,000	8,933,000	7,757,000	7,148,000	7,565,000	7,593,000
Rye	5,470,000	7,232,000	6,708,000	4,480,000	3,474,000	3,153,000	2,773,000	2,562,000
Buckwheat	752,000	790,000	1,027,000	924,000	828,000	769,000	792,000	826,000
Rice	1,345,000	1,089,800	1,118,550	980,900	869,000	802,000	693,000	733,000
Grain sorghums	5,342,000	4,893,000	6,036,000	5,153,000	3,944,000	4,153,000	....	....
Total	218,678,000	239,726,800	237,797,550	239,119,900	220,505,000	225,260,000	[2] 208,361,000	[2] 207,420,000
VEGETABLES:								
Potatoes	3,849,000	4,013,000	4,295,000	4,384,000	3,565,000	3,734,000	3,711,000	3,686,000
Sweet potatoes	1,022,000	1,029,000	940,000	919,000	774,000	731,000	603,000	611,000
Total	4,871,000	5,042,000	5,235,000	5,303,000	4,339,000	4,465,000	4,314,000	4,297,000
Tobacco	1,859,700	1,901,200	1,647,100	1,518,000	1,413,000	1,369,900	1,224,000	1,209,000
Cotton	35,504,000	33,344,000	36,008,000	33,841,000	34,985,000	31,412,000	36,832,000	35,330,000
Grand total	260,912,700	280,014,000	280,687,650	279,781,900	261,242,000	262,506,900	250,731,000	248,256,000

[1] Figures for 1919 are to be revised Dec. 14, 1920. (See Appendix.)

[2] Excluding grain sorghums.

Crop production in the United States—Continued.

[The figures are in round thousands—i. e., 000 omitted.]

Crop.	1920 (unrevised estimate, November, 1920).	1919 (subject to revision).	1918	1917	1916	1915	1914	Annual average, 1910-1914.
CEREALS.								
Corn........bushels..	3,199,126	2,917,450	2,502,665	3,065,233	2,566,927	2,994,793	2,672,804	2,732,457
Wheat........do....	750,648	940,987	921,438	636,655	636,318	1,025,801	891,017	728,225
Oats........do....	1,444,411	1,248,310	1,538,124	1,592,740	1,251,837	1,549,030	1,141,060	1,157,961
Barley........do....	191,386	165,719	256,225	211,759	182,309	228,851	194,953	186,208
Rye........do....	77,893	88,478	91,041	62,933	48,862	54,050	42,779	37,568
Buckwheat........do....	14,321	16,301	16,905	16,022	11,662	15,056	16,881	17,022
Rice........do....	52,298	41,059	38,606	34,739	40,861	28,947	23,649	24,378
Grain sorghums........do....	148,747	126,058	73,241	61,409	53,858	114,460	....	....
Total........do....	5,878,830	5,544,362	5,438,215	5,681,490	4,792,631	6,010,988	[1] 4,983,143	[1] 4,883,819
VEGETABLES.								
Potatoes........bushels..	421,252	357,901	411,860	442,108	286,953	359,721	409,921	360,772
Sweet potatoes........do....	105,676	103,579	87,924	83,822	70,955	75,639	56,574	57,117
Beans (commercial)........do....	9,364	11,488	17,397	16,045	10,715	10,321	11,585	....
Onions (commercial)........do....	15,132	9,412	19,336	12,376	8,562	7,664	(2)	....
Cabbage (commercial)........tons..	622	289	498	475	255	671	(2)	....
FRUITS.								
Peaches........bushels..	44,523	50,434	34,133	45,066	37,505	64,097	54,109	43,752
Pears........do....	15,558	13,902	12,993	13,281	11,874	11,216	12,086	11,184
Apples........do....	236,187	147,457	169,911	163,117	204,582	76,670	253,200	197,898
Cranberries (3 States)........barrels..	432	541	352	249	471	441	697	....

MISCELLANEOUS.								
Flaxseed....bushels..	10,736	8,919	13,369	9,164	14,296	14,030	13,749	18,353
Sugar beets....tons..	8,812	6,421	5,949	5,980	6,228	6,511	5,585	5,391
Tobacco....pounds..	1,476,444	1,389,458	1,439,071	1,249,276	1,153,278	1,062,237	1,034,679	991,958
All hay....tons..	106,451	108,666	91,139	98,439	110,992	107,263	88,686	81,640
Cotton....bales..	12,123	11,330	12,041	11,302	11,450	11,192	16,135	14,259
Sorghum sirup....gallons..	37,402	33,312	33,387	37,472	13,668	14,823	13,551	
Peanuts....bushels..	37,499	33,263	46,010	52,505	34,434			
Broom corn (5 States)....tons..	37	53	58	57	39	52		
Clover seed....bushels..	1,593	1,099	1,102	1,488	1,706			

Excludes grain sorghums.

[1] No estimate.

Exports of live stock from the United States.

[Bureau of Foreign and Domestic Commerce, United States Department of Commerce.]

Kind.	1920	1919	1918	1917	1916	1915	Annual average, 1910–1914.	3 months, July–September, 1920.
	Number.	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*
Horses	18,952	27,975	84,765	278,674	357,553	289,340	28,073	3,870
Mules	8,991	12,452	28,879	136,689	111,915	65,788	5,125	1,309
Cattle	93,039	42,345	18,213	13,387	21,287	5,484	88,225	16,718
Sheep	59,155	16,117	7,959	58,811	231,535	182,278	522,505	4,543
Swine	36,107	17,390	9,280	21,926	22,048	7,799	11,191	13,662

Exports of domestic foodstuffs and cotton from the United States.

[Reports of Bureau of Foreign and Domestic Commerce, United States Department of Commerce.]

Article exported.	Year ending June 30—							Annual average, 1910–1914.	Three months, July–September, 1920.
	1920		1919	1918	1917	1916	1915		
	Amount.	Per cent of 1910–1914.							
Wheat.............bushels..	122,430,724	215.1	178,582,673	34,118,853	149,831,427	173,274,015	259,642,533	56,913,228	82,178,319
Wheat flour........ .barrels..	21,651,261	202.8	24,181,979	21,879,951	11,942,778	15,520,669	16,182,765	10,678,635	4,449,059
Oats...............bushels..	33,944,740	408.8	96,360,974	105,837,309	88,944,401	95,918,884	96,809,551	8,304,203	1,978,174
Rye...................do....	37,463,285	4,382.9	27,540,188	11,990,123	13,260,015	14,532,437	12,544,888	854,765	15,141,843
Barley.................do....	26,671,284	337.8	20,457,781	26,285,378	16,381,077	27,473,160	26,754,522	7,895,521	5,455,503
Corn...................do....	14,446,559	36.3	16,687,538	40,907,827	64,720,842	38,217,012	48,786,291	39,809,690	2,967,236
Total, 5 cereals and flour........pounds..	16,862,895,172	200.0	21,996,905,576	13,951,418,808	19,330,110,628	20,780,577,136	26,567,042,632	8,429,735,124	7,141,988,840
Sugar..................do....	1,444,030,665	2,034.5	1,115,865,161	576,483,050	1,248,908,286	1,630,150,863	549,007,411	70,976,908	86,968,547
Dairy products:									
Butter.............do....	27,155,834	642.3	33,739,960	17,735,966	26,835,092	13,487,481	9,850,704	4,277,955	1,340,588
Cheese.............do....	19,387,158	394.2	18,791,553	44,303,076	66,050,013	44,394,301	55,362,917	4,915,502	1,287,329
Milk (condensed)..do....	710,533,270	4,504.5	728,740,509	528,759,232	259,141,231	159,577,620	37,235,627	15,773,900	74,782,516
Total dairy products, pounds...............	757,067,262	3,032.2	781,272,022	590,798,274	352,026,336	217,459,402	102,449,248	24,967,357	77,410,433

Meat and meat products:									
Canned beef....pounds..	31,166,814	331.8	108,459,660	97,343,283	67,536,125	50,803,765	75,243,261	9,392,122	6,693,169
Fresh beef.........do....	153,560,647	521.4	332,205,176	370,032,900	197,177,101	231,214,000	170,440,934	29,452,302	7,814,707
Pickled beef.......do....	32,383,501	98.5	45,065,641	54,467,910	58,053,667	38,114,682	31,874,743	32,893,172	5,739,643
Oleo oil...........do....	74,529,394	26.6	59,292,122	56,603,388	67,110,111	102,645,914	80,481,946	280,224,505	13,313,514
Oleomargarine.....do....	20,952,180	641.1	18,570,400	6,309,896	5,651,267	5,426,221	5,252,183	3,268,279	1,491,657
Stearin............do....	22,505,602	695.8	11,537,284	10,360,030	12,936,357	13,062,247	11,457,907	[1] 3,234,533	2,908,665
Tallow............do....	32,897,026	113.4	16,172,111	5,014,964	15,209,369	16,288,743	20,239,988	29,008,749	5,234,223
Canned pork.......do....	3,261,967	77.2	5,273,329	5,194,468	5,896,126	9,610,732	4,644,418	4,227,086	571,408
Fresh pork.........do....	27,224,941	1,345.2	19,644,388	21,390,288	50,435,615	63,005,524	3,908,193	2,023,911	3,011,289
Bacon.............do....	803,666,917	440.4	1,238,247,321	815,294,424	667,151,972	579,808,786	346,718,227	182,474,092	96,267,478
Hams and shoulders, pounds..............	275,455,931	165.1	667,240,022	419,571,869	266,656,581	282,208,611	203,701,114	166,813,134	26,742,682
Pickled pork....pounds..	41,680,619	86.3	31,503,997	33,221,502	46,992,721	63,460,713	45,655,574	48,274,929	8,463,660
Lard...............do....	587,224,549	123.8	724,771,383	392,506,355	444,769,540	427,011,338	475,531,908	474,354,914	124,408,577
Lard, neutral......do....	23,202,027	53.3	17,395,888	4,258,529	17,576,240	34,426,590	26,021,054	[1] 43,571,550	4,932,757
Lard compounds...do....	44,195,842	65.7	128,157,327	31,278,382	56,359,493	52,843,311	69,980,614	67,318,857	5,113,896
Sausage, canned.......do....	7,034,150	342.0	8,503,580	5,787,108	6,294,950	6,823,085	1,821,958	6,369,268	1,497,844
Sausage, other.........do....	14,750,963	....	9,721,925	9,239,341	9,134,471	8,590,236	5,183,525	....	848,228
Sausage casings........do....	24,379,414	72.5	13,524,093	6,173,578	6,118,060	14,708,893	30,818,551	33,644,928	5,662,148
Total 18 meat products, pounds..............	2,220,072,484	156.7	3,455,285,647	2,344,048,215	2,001,059,766	2,000,053,391	1,608,976,098	1,416,546,331	320,715,545
Total of food products mentioned above, pounds..............	21,284,065,583	214.1	27,349,328,406	17,462,748,347	22,932,105,016	24,628,240,792	28,827,475,389	9,942,225,720	7,627,083,365
Cotton.............pounds..	3,543,743,487	80.2	2,762,946,754	2,320,511,665	3,088,080,786	3,084,070,125	4,403,578,499	4,419,802,157	301,343,269
Grand total......do....	24,827,809,070	172.9	30,112,275,160	19,783,260,012	26,020,185,802	27,712,310,917	33,231,053,888	14,362,027,877	7,928,426,634

[1] 4-year average.

Estimated production of meat and wool.

[The figures are in round thousands, i. e., 000 omitted.]

Product.	1920	1919	1918	1917	1916	1914	1909
Beef[1]...lbs..	7,000,000	7,422,000	8,465,000	7,384,007	6,670,938	6,078,908	8,138,000
Pork[1]..do...	9,000,000	11,388,000	11,248,000	8,450,148	10,587,765	8,768,532	8,199,000
Mutton and goat[1].lbs..	600,000	635,000	537,000	491,205	633,969	739,401	615,000
Total.do...	16,600,000	19,445,000	20,250,000	16,325,360	17,892,672	15,586,841	16,952,000
Wool (including pulled wool).lbs..	307,366	313,160	298,870	281,892	288,490	290,192	289,420

[1] Estimated for 1914–1919 by the Bureau of Animal Industry. Figures for meat production for 1920 are tentative estimates based upon 1919 production and a comparison of slaughter under Federal inspection for 7 months of 1920 with the corresponding 7 months in 1919.

Number of live stock on farms on Jan. 1, 1910–1920.

[The figures are in round thousands, i. e., 000 omitted.]

Kind.	1920	1919	1918	1917	1916	1915	1914	Annual average, 1910–1914
	Number.	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*
Horses..........	21,109	21,482	21,555	21,210	21,159	21,195	20,962	20,430
Mules...........	4,995	4,954	4,873	4,723	4,593	4,479	4,449	4,346
Milk cows.......	23,747	23,475	23,310	22,894	22,108	21,262	20,737	20,676
Other cattle.....	44,485	45,085	44,112	41,689	39,812	37,067	35,855	38,000
All cattle.......	68,232	68,560	67,422	64,583	61,920	58,329	56,692	58,676
Sheep...........	48,615	48,866	48,603	47,616	48,625	49,956	49,719	51,929
Swine...........	72,909	74,584	70,978	67,503	67,766	64,618	58,933	61,865

Confronted with Falling Market.

After the farmers had completed their planting and harvesting operations, after they had met and solved the problems of production, they found themselves face to face with a falling market. As a result, a situation has been brought about which may have serious consequences, immediate and remote, to our agriculture and to the Nation.

During all the months when the farmers were cultivating their crops, paying for labor and supplies at unusually high rates, the prices of agricultural commodities generally remained high. In midsummer, when the farmers' period of outlay was nearly at an end and their income period was about to begin, a sharp decline occurred in the prices of practically all farm products. Covering nearly everything the farmers had to sell, it did not materially affect the articles they had to buy. For labor and materials used in harvesting they were compelled to pay prices substantially as high as those prevailing during planting and cultivation.

Shrinkage of Values.

The year's output, produced at an abnormally high cost, is worth, at current prices, $3,000,000,000 less than the smaller crop of 1919 and $1,000,000,000 less than the still smaller crop of 1918. In other words, it is estimated that the total farm value of all crops produced in 1920 is $13,300,000,000, compared with $16,000,000,000 in 1919, $14,300,000,000 in 1918, and $13,500,000,000 in 1917. Live stock and its products also declined to such an extent as to cause serious losses to producers. The best estimate that can now be made indicates that the total value of animal products in 1920 is $8,757,000,000, or about $200,000,000 less than in 1919. There is probably no other industry or business that could suffer a similar experience and avoid insolvency.

Relative Prices of All Crops.

It is interesting, in this connection, to note the relative prices during the year of all crops grown in the United States. On March 1 they were 22 per cent *higher* than on

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the same date last year; on April 1, 23 per cent; on May 1, 23 per cent; on June 1, 24 per cent; on July 1, 21 per cent; on August 1, they were the same as on August 1 a year ago; on September 1, they were 7 per cent *lower* than a year ago; on October 1, 14 per cent *lower;* and on November 1, 28 per cent *lower.* The prices of all crops on November 1 were 33 per cent below those prevailing when the farmer planted and bore the cost of production.

The situation may be presented in another way, using corn, cotton, and wool as examples. The corn crop totals 3,199,-000,000 bushels. At November 1 prices the farmers would receive for it approximately $1,500,000,000 less than what it would bring on the basis of prices prevailing in November a year ago. The cotton crop aggregates 12,123,000 bales. At existing prices it would lack more than $1,000,000,000 of bringing as much as it would have brought at 1919 prices. The wool clip, including pulled wool, amounts to 307,366,000 pounds. At prices prevailing in October, 1919, it would have brought $153,683,000, but this year, on the basis of current prices, it would bring $84,525,650, a reduction of about $69,000,000.

This means that the farmers of the United States, as a whole, are not receiving adequate returns for their efforts. It means also that the very foundation of our Nation—the stability of our agriculture—is threatened, and that everything possible must be done to prevent, or at least to lessen the effect of, the recurrence of conditions under which large numbers of farmers conduct their operations at a loss. The farmer must have, under ordinary conditions, a reasonable prospect of a fair return for his labor and the use of his capital. The science, the art, and the business of agriculture can not thrive unless he is suitably and profitably paid for the products of his farm—unless he receives compensation sufficient to enable him to continue to produce and to maintain for himself and his family satisfactory standards of living.

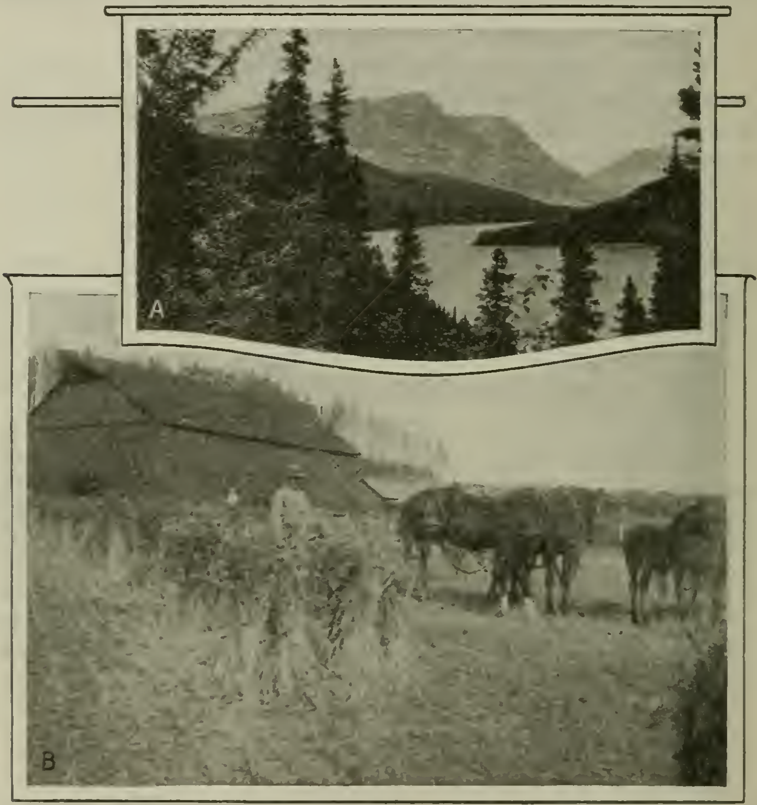
No Single Solution for Situation.

A sober national thought with regard to the importance, the absolute necessity, of a sustained agriculture in this country is imperative. There is, perhaps, no single solution for the situation which the farmers are now facing, but there are many steps which can and should be taken to place our agriculture on a more satisfactory basis and to stabilize the business of farming, not in the interest of the farmers alone but in the interest of the Nation as a whole. The matter is of such tremendous importance to our entire population that it should be recognized everywhere as a national problem and dealt with as such.

We must adopt every feasible means to enable the farmer to adjust himself to changes in economic conditions such as have recently occurred. It ought to be a fact that, when the farms of the country produce abundantly, the consuming public will be liberally supplied with food at reasonable prices, the farmer taking his profit because of large production and the consumer receiving his increment of benefit from having available an adequate supply at a reasonable cost. In general, we should expect it to be true that the farmer's condition is improved in direct proportion to the number of bushels of wheat or corn or the number of bales of cotton he produces. It frequently happens, however, that, when all farmers have extraordinarily good crops during the same year, low prices leave him worse off than he has been in other years with short crops and high prices. One thing that would help to remedy this is some means of carrying over to periods of low production, wherever feasible, the surplus from years of high production. More attention to marketing and the development of the latent consumption demand in years of large supply also would be helpful.

Study of World Conditions.

The Department of Agriculture has been fully alive to the existing situation and has been keeping in close touch with market conditions, ready at all times to render any feasible aid in reducing the losses suffered by farmers on account of the price declines. The drop in the price of wheat was especially sharp and it was charged, in many quarters, that this was due to manipulation, control, or other artificial causes, as well as to the importation of Canadian wheat into this country. You, Mr. President, therefore, asked the Federal Trade Commission immediately to ascertain whether there was any basis for this charge, and I understand that the commission is actively at work on the problem. At the same time, you requested the Department of Agriculture to obtain all available information regarding the world supply of and demand for wheat, including the importation of Canadian wheat and its probable effect on



Alaska Is Rich in Natural Resources.

The Department of Agriculture is giving attention to increasing crops, building up reindeer herds for meat, perpetuating the fur industry, and above all to the development of the timber resources on the Alaskan National Forests.

the domestic market, and the department has proceeded vigorously with this task. Recognizing, also, that the depressed market situation was due, in part at least, to conditions following the World War and to the lack of buying power and decreased consumption in European countries, a committee was appointed in the department to canvass the entire agricultural situation with the view of collecting all available data having any bearing upon it. These data will enable us to see more clearly the problems that lie ahead of us. As soon as the material can be brought together and put in satisfactory shape, it will be published in order that farmers may be in position to determine what the trend in the future is likely to be and what they may do to adjust their operations next spring to world conditions. In this work, the department has had the cooperation of a committee representing the agricultural colleges and experiment stations and also of representatives of farmers' organizations.

Marketing Work Should Be Expanded.

We must see to it that the road between the producer and the consumer is open and direct and that the farmers have a free and competitive market in which to dispose of their products. We must omit no effort to improve our marketing machinery and practices and to furnish necessary market information to the farmer so that he may take full advantage of modern business methods in the distribution of his commodities. The Bureau of Markets, created in 1913, is devoting its attention to the solution of the many complex problems arising in connection with the marketing of farm products. It is dealing, first of all, with several fundamental steps which are essential to constructive work in this great undeveloped field. These include particularly the accumulation of fundamental data regarding marketing processes and costs; the dissemination of accurate, disinterested market information; the elimination, wherever practicable, of waste and unnecessary marketing expenses; the development of standards for the grading of farm products and the standardization of containers; the promotion of efficiency in the storing, handling, and shipping of farm products; and the regulation of marketing machinery in order to prevent any abuses or sharp practices that may exist. Work along these lines is being prosecuted as vigorously as possible with the available funds and facilities, and provision has been made in the estimates to be submitted to the Congress at its next session, for its further development during the next fiscal year. If the necessary appropriation is granted, special emphasis will be placed upon studies relating to the costs of marketing and the systematic collection and dissemination of statistics regarding the production and supply of, and demand for, agricultural products in foreign countries.

Costs of Marketing.

For some time it has been evident that reliable data regarding the costs of marketing should be gathered in order to supplement similar data concerning the costs of production. In fact, such data are essential to the correct understanding of our marketing processes and are fundamental to the development of plans for their improvement and the elimination of lost motion and unnecessary expenses. We should be able to indicate, with a fair degree of accuracy, the proportion of the consumer's price received by the producer and the proportion received by various marketing agencies. Studies with reference to the cost of marketing live stock, grain, milk, and potatoes are now under way, and it is highly desirable that they be extended, as rapidly as possible, to include other staple agricultural commodities.

Cooperative Marketing.

The question of cooperation now occupies a prominent place in the public mind. High distributing costs have stimulated and increased the demand for greater efficiency in marketing. Producers everywhere are outspoken in their dissatisfaction with present marketing costs, which appear to exact an unduly large share of the price paid by the consumer. In their effort to reduce marketing expenses, producers are turning in many cases toward cooperative marketing. The distribution of farm products through cooperative organizations undoubtedly affords an opportunity for farmers to make more effective use of market information, to properly grade and market their products in commercial quantities, to find larger outlets, and to reduce costs and increase efficiency by shortening the channel between producers and consumers. In addition to more or less localized efforts, organizations of growers of wheat, cotton, and live stock have recently projected movements for the development of cooperative marketing on a broad scale.

The department recognizes fully the importance of the cooperative movement and its potentialities for good in the general marketing scheme, conducts investigations relating to its status and progress, and gives assistance to specific groups of producers who request help in the organization and operation of cooperative enterprises. This work should be extended and developed.

Foreign-Market Information.

Comparatively little systematic attention has been given to the development of foreign markets for farm products, or to obtaining and making available prompt, comprehensive, and dependable information with reference to the production, supply, and prices of, and demand for, agricultural commodities in the different parts of the world. While the Bureau of Markets has developed, to the extent permitted by available funds, a very efficient market-reporting service for the United States, no similar machinery for collecting and disseminating foreign-market information has been provided. The foreign markets division of the bureau is endeavoring to keep in close touch with conditions abroad, but it has neither the personnel nor the facilities for meeting the demands made upon it. It is highly essential that definite provision be made for the building up of this branch of the department's work, in order that it may be in position to render effective service to producers, farm organizations, and others. Since May, 1918, an agricultural trade commissioner has been stationed in the United Kingdom to study the markets for agricultural products in Europe and to make timely reports for the information of American producers and exporters. The work of this commissioner has conclusively demonstrated the desirability of stationing additional commissioners at strategic points in the various markets of the world. Plans already have been developed for the establishment of an office in Buenos Aires to aid in promoting our trade with South America in purebred live stock.

The establishment of a world market-reporting service will not interfere in any way with the activities of the International Institute of Agriculture at Rome, but, on the contrary, will effectively supplement them. The reports issued by the institute are based largely on the official estimates of the various adhering Governments, but many of them are incomplete or are received too late to be of immediate practical service to producers and others in this country. They are, nevertheless, highly useful for historical and comparative purposes. The work of the institute was greatly interfered with during the war, but, following the meeting of the general assembly in Rome on November 3, it is anticipated that it will resume active operations. After the death of Mr. David Lubin, the delegate of the United States, this country was without representation at the institute for nearly two years. This was due to the fact that the amount allowed for salary and expenses, $3,600 per annum, made it impossible to secure a man with the right sort of training and experience who would be willing to undertake the work permanently. At the suggestion of this department, the Secretary of State has recommended that the salary of the delegate be increased to $7,500 per annum, and that provision be made for the payment of his traveling and miscellaneous expenses and for the employment of a secretary.

Combine Marketing and Crop-Estimating Work.

I have recommended in the estimates to the Congress that authority be given to consolidate the Bureau of Crop Estimates and the Bureau of Markets. I have been influenced to take this course by a number of important considerations. The first is that each of the bureaus, in accomplishing the important work with which it is charged, needs the additional strength that could be brought to it by some portion of the machinery of the other. In the second place, the legal duties of the two overlap in some directions, and there is a natural and inevitable tendency for each bureau to duplicate a portion of the other's work. This tendency would be eliminated by the proposed consolidation, and confusion in the public mind as to the division of work between the two bureaus would be avoided. Furthermore, crop and market reports could be published together, and farmers and business men would have all the facts in one document. The leased telegraph wires of the Bureau of Markets could be utilized for transmitting crop information to Washington and for its prompt dissemination. In some States, the branch offices of the two bureaus could be brought together in the same quarters, and frequently the same crop and live-stock specialists could serve both bureaus, not only in this country but abroad. The operating forces of the two organizations could be combined, as well as the duplicating and mailing services and the staffs dealing with the purchase, custody, distribution, and utilization of supplies. Specialists working along statistical and economic lines in both bureaus could be brought together in a statistical research division to handle statistics of production, consumption, imports and exports, surpluses and deficiencies, and farm and market prices of agricultural products for all countries. In short, the proposed consolidation is in line with good administration and efficiency in the public service and should be put into effect without delay.

Crop and Live-Stock Reporting Service.

No problem can be satisfactorily considered, nor can any business be permanently successful, without accurate and complete statistics. Agriculture is the greatest business and the most fundamentally important industry in the United States, not only because of the amount of capital invested, the number of people employed, and the new wealth created annually, but because it supplies the Nation's food, furnishes vast quantities of raw materials for the manufacture of clothing and other necessary commodities, and contributes largely to the export trade of the country.

The Bureau of Crop Estimates, through more than half a century of experience, has developed and perfected methods for ascertaining and verifying many of the essential statistical facts of farm production. It is operating during the present fiscal year under the serious handicap of inadequate funds and reduced personnel, in the face of a constantly increasing demand for the services it is designed to render. Its appropriations were reduced by $53,000 at the last session of the Congress, necessitating the discontinuance of the special reporting service for cotton, tobacco, rice, potatoes, truck, and fruit crops. Not only should this service be restored, but, as the demand for agricultural statistics, especially in connection with marketing problems, is steadily increasing, the time has come when an expansion of the machinery of the bureau is urgently needed. The data collected by the 1920 census will soon be available as bases for crop and live-stock estimates during the next 10 years, and the expansion should be provided for without delay. The crop and live-stock reporting service should be greatly en-

Press Representatives Waiting for the Release of a Crop Report.

larged; farm surpluses should be ascertained periodically, and essential data should be published more promptly and in such form that they may be readily understood and utilized. Estimates of the funds required to enable the department to accomplish these purposes will be submitted to the Congress.

Supervision of Live-Stock Markets.

The supervision of the live-stock markets, authorized by the President's proclamations of June 18 and September 6, 1918, issued under the provisions of the food-control act of

August 10, 1917, has been continued by the Bureau of Markets, but the work has been greatly handicapped by the lack of funds. Definite proof was obtained that certain firms were exacting overcharges in the feed accounts of their shippers, and they were given an opportunity to refund the overcharges. Some did so, but six of them sought and obtained from the district court at Chicago an order restraining the Secretary of Agriculture from revoking their licenses. These cases are still pending, and further action on all similar cases involving such overcharges is necessarily deferred, awaiting the decision of the court.

In July and August, 1920, commission men in Chicago, Kansas City, Omaha, and East St. Louis put into effect new schedules of commission rates, providing increases ranging as high as 25 per cent on cattle, calves, hogs, sheep, and goats shipped in car lots by single owners. After careful consideration of the evidence and data in the possession of the department, the conclusion was reached that these increased rates were unjust and not warranted by trade conditions. Orders were issued, therefore, to all commission men in the cities named to refrain from exacting the increased rates or charges. They not only did not comply with the orders, but some of them instituted suits in the Federal courts to restrain the department and the United States attorneys from proceeding against them for failure to do so. Temporary restraining orders were granted by the courts and dates were set for the Government to be heard. At the hearings in Chicago and Kansas City, the department cooperated with the United States attorney in the argument of the legal questions involved, and the whole matter is now before the courts for determination. At Kansas City, under an order of the court, the commission men are depositing with the clerk of the court, to abide the results of the litigation, all receipts by them which represent the difference between the commissions they were ordered to discontinue and those found to be just and reasonable. A similar practice is being followed at Omaha and East St. Louis.

Another order was issued by the department in August, 1920, declaring the rates charged by the commission men at Chicago, Kansas City, Omaha, and East St. Louis for handling car lots having more than one owner to be unjust, unreasonable, discriminatory, and unfair, and substituting a different and equitable schedule of rates. This action was taken on the basis of information in the possession of the department and after a hearing held in Chicago on April 12 and 13, 1920, at which seven commission firms operating under Federal licenses appeared. The order of the department was complied with at Chicago and the lower rates made effective there, but it is being contested at the other points in conjunction with the suits involving the rates for single-owner shipments.

Farm Management and Farm Economics.

The economic problems of argicultural production have long been uppermost in the minds of American farmers. They are pressing for solution and their importance has been sharply emphasized by the recent price declines. In spite of many handicaps, the Office of Farm Management and Farm Economics is dealing actively with these problems, giving special attention to matters relating to cost of production and farm organization, farm labor, farm finance, land economics, including land settlement and colonization, and the social side of rural life. Following the reorganization of the office in 1919, there was submitted to the Congress a revised estimate calling for additional funds for the development of its activities along the lines recommended by the committee on reorganization. The Congress, however, did not take favorable action on the proposal and no increase was granted. The recommendation was renewed in the estimates of the department for the fiscal year 1921, but the Congress again failed to provide the amount suggested, although it did grant a small increase over the appropriation for the fiscal year 1920.

In the estimates for the next fiscal year, I am recommending that an adequate sum be made available to the Office of Farm Management and Farm Economics for the prosecution and development of the important projects upon which it is engaged. I am recommending, also, that the name of the office be changed to "Bureau" of Farm Management and Farm Economics. If the necessary appropriation is granted, it is proposed to expand materially the studies of the cost of producing farm products and also to develop the other lines of work under way.

Cost of Production.

Several valuable contributions to the available data regarding the cost of producing farm products, particularly cotton, wheat, and beef cattle, already have been made. There has been a constant demand from the public generally, but more especially from farmers and farm organizations, for the results of these studies, and it has been repeatedly urged that they should be extended and others undertaken. There is urgent need of cost studies with reference to such crops as corn, oats, sugar beets, beans, rice, etc., and there is equal need of adequate and comprehensive studies relating to the organization of various types of farms and ranches.

Such studies furnish the farmer information which enables him to reduce expenses or otherwise to increase his profits. If he makes full use of it, he will be in position to adjust his operations from time to time to those enterprises which will yield a satisfactory profit, to add to his individual income, and, ultimately, to influence the prosperity of his community. Cost studies also inform the general public regarding the cost of producing farm products and should tend to bring about a more general realization on the part of the consumer of the necessity of paying prices which will adequately reward the farmer and secure the necessary supplies in the markets.

The Farm Labor Problem.

The seriousness of the farm labor problem is everywhere realized. It has been present in more or less acute form for more than a decade and failure to recognize its complexity has resulted in many unwise attempts to solve it. Thoroughgoing scientific study of the whole problem is needed as a basis of action, but such a study has been impossible up to this time because of the lack of funds. During the present fiscal year, only $5,000 is available for the purpose. While this sum is entirely inadequate to cover the whole field, a promising beginning has been made and sufficient funds should be provided for the prosecution of the work on a more comprehensive basis.

Farm Finance.

The financial problems of the farm have become more and more involved, until to-day they rank in importance with the financial problems of commercial industries. While an excellent beginning has been made in the study of farm-mortgage credit, farm insurance, and personal credit, sufficient funds are not available to deal adequately with many matters about which information is needed, including the methods employed and results obtained by farmers in attempts to improve their credit through united and cooperative action; life insurance in relation to farm finance, covering the use of life insurance contracts as a means of improving the credit of the farmer; methods of taxation as they affect agriculture; crop and live stock insurance, the need of such protection and the agencies offering it; and the place of accident and liability insurance in farming operations.

The possibilities of well-directed cooperative effort among farmers are well illustrated by what has been done in the field of mutual fire insurance. There are at present nearly 2,000 farmers' mutual fire insurance companies in the United States, with outstanding risks aggregating $6,000,000,000. This enormous volume is carried at an average cost, for the country as a whole, of only 25 cents per $100 per year, and, in individual cases, companies of this kind have furnished high-class protection to their members for half a century or more at a cost of less than 10 cents per $100 per year. This result has been achieved, in part, by the elimination of unnecessary expenses of operation, of the so-called moral hazard, and of many of the physical hazards involved in farm risks.

While the department has rendered much assistance in connection with this form of cooperation, through the preparation of a suggested classification of farm risks and suitable record forms which embody the methods and practices that have proved to be most efficient in conserving farm property and in reducing the cost of insurance, a great deal remains to be done. In many States, cooperation for insurance and credit purposes is as yet little understood or practiced.

Personal Credit.

It is generally recognized that one of the problems demanding special attention at this time is that of short-time personal credit for farmers. In the case of a man who has paid for his farm, the supplying of personal credit raises, as a rule, no serious question. In the case of the renter, however, and of the young farmer who is just starting out as an owner, the question of short-time credit is a difficult one. In such cases, credit can and should be based, to a considerable extent, upon character and productive ability. To deny credit to the honest, ambitious, and energetic farmer because he has little tangible security to offer is to lessen the productivity of available capital and to discourage a man who, in the future, should be a land-owning farmer. While the bankers are, in many cases, showing a commendable interest, the need is for a system which will enable the man without collateral to secure funds for productive agricultural enterprises. Without doubt, this important problem should receive careful consideration, and every feasible effort should be made to aid the farmer in obtaining the necessary personal credit.

The Problem of Farm Ownership.

Closely related to the credit question is the problem of land ownership, to the solution of which national thought will, of necessity, be directed during the years that lie immediately ahead. It involves the conditions upon which men may own the land they till; upon which young men and women, marrying and embarking upon their careers, may acquire homes where their families may be reared, educated, and brought to maturity in the essentials of good citizenship. With the passing of the great public domain, and with it our free lands, the problem has taken on added importance, and to-day represents one of the gravest social and economic questions with which the Nation has to deal.

Considerable work already has been done in this field, but it has not yet been adequately covered. Careful studies are being made of the methods of renting farm land and of improving tenant contracts, which at present are frequently inadequate. They encourage in many instances soil depletion, which, if not corrected, will, in the long run, seriously affect our production. They also encourage itinerancy on the part of tenants and constitute a barrier to community social betterment. The causes of tenancy and what it means to the country must be placed squarely before the American public so that its importance may be generally recognized. If this is to be done, studies of a thoroughgoing nature must be initiated and carried to completion.

Price of Farm Lands.

The price of farm lands is one of the important factors in the problem of farm ownership. It is estimated that between March, 1919, and March, 1920, the increase in the selling price of farm land and improvements was 21.1 per cent. In the last five years the increase has been 65 per cent. Although the data for the census of 1920 are not yet available, it seems probable that, while the average price of farm land and improvements per acre increased only 20 per cent during the 40 years from 1860 to 1900, the price in 1920 is two and one-half times that of 1910 and five times that of 20 years ago.

In some sections, the net return on the purchase price of farm lands is considerably less than the ordinary rate of return on first mortgages and similar investments. The rental rate of cash leases, also, is frequently less than half the rate of return on mortgages. Studies made by the department indicate that, in certain regions, the recent advance in the price of land has still further aggravated this condition. Such a situation is unfortunate, for it increases the difficulties of a tenant who is seeking to become an owner. If he borrows a considerable part of the purchase price of a farm at from 5 to 7 per cent and then finds that the investment will earn little more than 3 per cent, it will be impossible, in many instances, for him to discharge the debt.

While the increase in land prices is, to some extent, a reflection of the general upward movement in the level of commodity prices, it must be regarded, in part, as an indication of the increasing scarcity of land available for agricultural use. This scarcity is not statistically apparent, for, in addition to the area of improved land used for crops, pasture, and other farming purposes (exclusive of range land), there is nearly an equal area that is potentially available after clearing, drainage, irrigation, or for utilization by dry-farming methods. With local exceptions here and there, however, this land is either inferior to that now in use or can be made available for farming only through heavy outlays for improvement.

Area Expanded During the War.

War conditions stimulated an expansion of the area devoted to crops, estimated at 10.1 per cent from 1914 to 1918, or an increase of 3.4 per cent in the per capita acreage. This was effected by utilizing pasture land for crop production and by bringing into use other uncultivated areas. The expansion was particularly marked in the case of small grains. Since the armistice, there has been a reduction in crop acreage. From 1919 to 1920 there was a decline of 5.4 per cent in the acreage of 20 principal crops. Apparently, the reduction has been brought about by returning the land to pastures and by discontinuing the use of the low-grade areas which were temporarily utilized.

These changes should be instructive to those who would reduce the prices of farm products by bringing into use large areas of new land. It is clear that, if prices had been extraordinarily remunerative to the farmer compared with the returns on capital and labor in industry, we would not witness this reduction of the acreage in cultivation, but, on the contrary, a continued enlargement of it. While war conditions temporarily increased the net cash income of the farmer and stimulated a temporary expansion of the crop area, this was due in large measure to the response of the farmers to the insistent call for more food, particularly wheat and rye, the principal bread grains. It is of no small significance that the contraction in acreage has been most extreme in the case of these crops, estimated at 31.5 per cent for winter wheat, 16.5 per cent for spring wheat, and 22.6 per cent for rye.

Much loose thinking and many wrong conclusions are based on false impressions concerning the profitableness of farming. The increase in farm profits during the war was inevitably transitory. Moreover, measured in purchasing power, they shrank rapidly as a result of the rise in general commodity prices. Owing to the highly competitive character of his business and the lack of organization, the farmer has had no effective means of preventing the impairment of his profits: his only recourse has been to migrate to the city and change his occupation, a course actually followed by many. In the light of these facts and the fear of a continued decline of profits, it is clear why the tendency to expand the crop area has been suddenly reversed.

Land Settlement and Colonization.

While present conditions do not seem to justify a policy of encouraging and stimulating the extension of the farm area, it must be recognized that some new land is continually being brought into cultivation in certain regions. Moved by the spirit of adventure characteristic of Americans, by the desire to rise from the status of tenancy to the more independent status of farm ownership, by propaganda which portrays to city people in alluring fashion the attractiveness of country life, and particularly by the effective advertising and skillful salesmanship of various kinds of private land settlement agencies, men may be expected to try their fortunes in the development of raw farm land, even in periods when conditions do not favor agricultural expansion and when the net migration to cities is above the normal. It is of the highest importance that these men be enabled to embark in such undertakings with the greatest possible assurance of success, for the failure of one is likely to result in the discouragement of many.

In an earlier period of our history, the development of new agricultural areas was largely the result of the initiative of individuals. At present, it is, to a considerable extent, under the guidance of private agencies engaged in promoting the settlement and sale of land for profit. Whether the methods employed by some of these enterprises are such that private profit is not incompatible with the rendering of important service in facilitating the wise selection of land, in providing suitable arrangements for credit, and in creating conditions favorable to the success of the settlers, can be determined only by comprehensive investigation. During the past year the department has begun a study of the problem. On account of its magnitude, final conclusions may not be available for some time, but enough progress has been made to reveal the fact that numerous agencies, whose volume of business is very great, are preying on the impulse to acquire farm land, and that the results in misdirected investment of capital, futile labor through years of unavailing struggle against hopeless odds, and consequent discouragement and despair, are too serious to be ignored. The comfortable doctrine of leaving the buyer to take care of himself has been discarded in many phases of our national life. Surely, in the settlement and development of land, the buyer should at least have full and complete information for his guidance.

It appears that under existing conditions we should not attempt to stimulate unduly the normal rate of settlement, but rather to guide and protect the normal movement along lines which will insure a reasonable degree of success in the development of new lands with a minimum of wasted capital and human effort. It yet remains to be determined whether this purpose can best be accomplished by governmental action, by private enterprise with comprehensive attempts to educate both land-settlement agencies and prospective settlers in the methods most favorable to success, or by private agencies systematically regulated.

Life on the Farm.

Life on the farm and in the rural community gives rise to problems the solution of which is of vital importance to American agriculture and American civilization. It has been demonstrated that these problems are susceptible of scientific investigation. Valuable studies already have been made by the Office of Farm Management and Farm Economics, and they should be enlarged and others instituted, including especially studies relating to the human aspect of tenancy and landlordism, migration from farm life, population groups, and community planning.

In our country, agriculture, manufacture, transportation, merchandising, and professional service—strong competitors with one another for both capital and workers—are all expected to hold their own. The history of agriculture seems to show, however, that farming is in periodic danger of losing its grip on both capital and workmen and of allowing them to slip away into city industries. Statesmen have always viewed with alarm the tip of the scales from farming to industry and from country life to urban life. When the farm loses its balance to the city, the Nation is threatened with a food shortage or with dependence upon foreign countries for essential foodstuffs. But the shortage of food is not the only danger. When American agriculture begins to lose ground, the political stability of the Nation is endangered.

Shift from Country to Cities.

The returns from the 1920 census are not yet sufficiently complete to make a full statement of what has occurred during the last decade in the shifting of populations between city and country. The reports on somewhat more than one-third of the counties of the United States, however, indicate an actual reduction in the rural population in many counties of New England and New York, in some parts of the South, and in the heart of the corn belt. Some of them lost in rural population during the preceding decade, while others are losing for the first time now. On the other hand, many rural counties in the Northwest, the West, the South, and the coast States have been gaining.

There is every reason to believe that the same causes which account for a relatively decreasing agricultural population in former decades have been at work during the past 10 years. The increased standards of living of the American people as a whole have caused a great expansion in all industries centering in cities; and the industrial bid for workers, accelerated by conditions during and immediately following the war, has been a strong magnet exerting a pull upon workers in agriculture.

The following table shows the percentage of the total number of persons employed in all American occupations who were engaged in agriculture from 1820 to 1910:

1820	87.1
1840	77.5
1870	47.5
1880	44.4
1890	39.2
1900	35.7
1910	32.9

We may expect for 1920 a lower percentage than for 1910; in fact, it will not be surprising if the complete returns show that only 30 per cent of our workers are farmers. It is true, of course, that increased efficiency in farming operations, resulting from the use of new and better machinery and the application of scientific knowledge, has consistently lowered the demand for labor in certain kinds of farm work, and that the labor thus released has been the first to yield to the call of the city. It is a well-known fact, also, that Army life and its accompanying set of new associations detached from farming and from rural life a considerable number of farm youth. Whether this loss is a permanent one no one can say, but, in any event, it must be considered unusual.

The Real Concern of America.

The real concern in America over the movement of rural population to urban centers is whether those who remain in agriculture after the normal contribution to the city are the strong, intelligent, well-seasoned families, in which the best traditions of agriculture and citizenship have been lodged from generation to generation. The present universal cry of "keep the boy on the farm" can and should be expanded into a great public sentiment for making country life more attractive in every way. Neither force nor exhortation will keep people in the rural districts if they are to be deprived of the benefits of modern social, educational, and other opportunities. But when farming is made profitable and when the better things of life are steadily brought, in increasing measure, to the rural community, so that farm families need not give up farming in order to satisfy their desires for the best that modern civilization affords, the great motives which lead youth and middle age to leave the country districts will be removed. In order to assure a continuance of the best strains of farm people in agriculture, there can be no relaxation of the present movements for a better country life, economic, social, and educational.

Better Country Life Will Keep the Boy on the Farm.

The Hazards of Agricultural Production.

Given a sound basis of distribution, the curtailment of the so-called hazards of production—plant and animal diseases, insect pests, predatory animals, and rodents—with resulting increased yields per acre and reduced costs of production, will go far toward insuring a just measure of prosperity to the producer, with a fair scale of prices to the consumer. If the increasing population of the Nation is to be fed from the available farm lands in the United States, the efforts to reduce or eliminate such hazards must be prosecuted more vigorously in the future than ever before, and the fundamental research work which constitutes the basis of these efforts must have proper appreciation and support.

Plant Diseases.

The toll exacted by plant diseases is appalling. Every season, and in substantially every important producing region, they constitute a heavy handicap on crop production. When it is remembered that the cost of producing diseased and healthy crops, up to the time of harvest, is practically the same, it is clear that plant diseases are a grievous and dangerous overload on our agriculture. It has been estimated that in 1919 field diseases were responsible for the loss of approximately 190,000,000 bushels of wheat, of 78,000,000 bushels of oats, of 200,000,000 bushels of corn, of 86,000,000 bushels of potatoes, of 58,000,000 bushels of sweet potatoes, of 18,000,000 bushels of apples, and of 1,742,000 bales of cotton. The department for many years has been doing everything possible to reduce these and other losses, and excellent results have been secured in many directions.

One of the most significant activities now under way is the effort to reduce the tremendous losses from wheat rust, aggregating in some years as much as 200,000,000 bushels. Scientific investigation has proved that the fungus which is responsible for the disease gets its start in the spring on the common barberry plant, and a vigorous campaign, therefore, is being conducted, in cooperation with the various States, to eliminate such plants. More than 4,600,000 barberry bushes have been located, and of these 3,500,000 or more have been destroyed. Progress also has been made in developing a method for controlling wheat scab, which caused in 1919 the loss of nearly 60,000,000 bushels of wheat; a convenient method of testing seed corn for germination and of eliminating disease infection before planting has been devised; and much has been accomplished in working out practical control measures for other injurious plant diseases.

Insects.

The work of controlling insect outbreaks has presented many difficult and complex problems. The task, begun in 1917, of exterminating the pink bollworm, which experts in this and other countries regard as probably the most destructive pest of cotton, gave promise of success: but a new and serious situation has been presented by the discovery of the insect in a district in Louisiana not heretofore known to be infested and by its reappearance in southeastern Texas. The efforts to eradicate the pest are being prosecuted as vigorously as possible, but they are necessarily handicapped by the failure of the State of Texas to establish and enforce noncotton zones in the infested areas. Whether eradication can be accomplished in the circumstances is problematical. but. nevertheless. no steps should be omitted to prevent the

A Cloud of Calcium Arsenate Dust to Kill Boll Weevils.

additional drain on the South's most important money crop which the spread of the pink bollworm to other sections of the cotton belt would involve.

The boll weevil causes enormous damage to the cotton crop. But the department's experts, after many years of painstaking experiments. have now found a successful method of controlling the pest by dusting the plants with calcium arsenate. As a result, the manufacture and sale of this product has reached very large proportions. Through its enforcement of the insecticide and fungicide act, the purpose of which is to insure a high standard of purity and efficiency in insecticides and fungicides used in combating plant diseases and insects, the department is keeping off the market a great many tons of calcium arsenate of poor grade which, if used, not only would fail to control the boll weevil but would seriously damage the cotton plants.

The Corn Borer.

The campaign against the corn borer, a dangerous enemy of corn, is actively under way. The insect, so far as now known, is apparently confined in this country to New England, New York, and a township in Pennsylvania, and everything possible must be done to prevent its spread to the great corn belt of the Middle West. Two infested areas have been discovered recently in Ontario, Canada, one of them just across the lake from Buffalo and the other extending for 50 miles in either direction from St. Thomas. These areas, comprising approximately 12,000 square miles, constitute what is probably the worst infestation in North America at the present time. The officials of the Bureau of Entomology and the Federal Horticultural Board have been in consultation with the Canadian entomologists, and will cooperate with them, so far as possible under existing law, in the effort to prevent the spread of the insect into the United States at points far removed from the present infestation in this country.

The Gipsy Moth in New Jersey.

For years the department has successfully prevented the westward spread of the gipsy and brown-tail moths, great enemies of orchards and forests as well as of shade trees. It has been discovered recently, however, that a large area in New Jersey is infested by the gipsy moth, which apparently was brought in from Europe years ago, and that trees from this area have been shipped to a number of points, thus indicating the possible occurrence of the insect in other sections of the country. The Congress will be requested, at its next session, to appropriate sufficient funds to undertake the extermination of the pest in New Jersey, and, in the meantime, all shipments of trees from the infested area are being followed up as closely as possible in order to determine the other points at which the insect may have become established.

Emergency Fund to Combat Insect Outbreaks.

Every year demands are made upon the department, as in the case of the gipsy moth in New Jersey, for assistance in dealing with sudden and serious outbreaks of injurious insects which often cause damage amounting to millions of dollars. As a rule, no funds are available for this purpose, and the department, therefore, is unable to take prompt and effective steps to eliminate the pests or to prevent their spread. If repressive measures were immediately undertaken, it might be possible to completely exterminate them; otherwise, the outbreaks may get entirely out of hand and make necessary greatly increased expenditures, not to eradicate but merely to control them. It would be highly desirable, therefore, to provide a special appropriation, in the nature of an insurance fund, which could be used to meet emergencies of this sort, and a recommendation to this effect has been incorporated in the estimates.

Predatory Animals and Rodents.

The systematic campaign to curtail the losses caused by predatory animals and prairie dogs, ground squirrels, and similar rodents on the western ranges has been continued. It has been estimated that these pests destroy annually more than $300,000,000 worth of live stock, crops, and range grass. The hunters in the service of the department killed more than 25,000 predatory animals last year, and perhaps an equal number were destroyed by poisoning campaigns, resulting in a saving to the live-stock industry of more than $6,000,000. It may be added that, since the work was begun in 1915, the skins of the animals destroyed have been sold and the net proceeds, aggregating more than $240,000, turned into the Treasury.

Live-Stock Diseases.

Much headway has been made by the department toward the eradication or control of live-stock diseases. The campaign against tuberculosis in cattle, begun three years ago, has aroused increasing interest among live-stock owners and

State officials and has received their active support. On June 30, 1920, 3,370 herds, approximately three times the number at the beginning of the fiscal year, were officially accredited as free from tuberculosis. In addition, 16,599 herds have successfully passed one test. A total of 695,364 animals were examined during the year, resulting in the slaughter of 28,616 reactors. Applications for the testing of herds, however, have continued to accumulate more rapidly than they could be handled with the available force of veterinarians. Near the end of the fiscal year 4,740 herds were on the waiting list to be tested.

Tuberculosis is one of the greatest menaces to the livestock industry of America. The elimination of the constant losses caused by it would materially reduce the hazards of the industry and would tend to place it on a more stable basis. The rapidity with which the disease can be stamped out depends upon the amount of money appropriated for the work. The more money that is available in the immediate future, the more quickly will the losses be reduced and the larger will be the areas freed from the scourge.

Considerable progress has been made in the control of hog cholera, the greatest limiting factor in swine production. It has been estimated that, as the result of the activities of the Department of Agriculture and of its cooperating agencies in combating this disease, a saving amounting to $41,000,000 annually is effected. There were formerly 140 veterinarians assigned to this work, but the number has been reduced to 54 because of a curtailment in funds. The swine industry is one of the most important branches of our agriculture, and it is highly essential that the losses from cholera be kept at the lowest possible figure. The force engaged in the work has never been sufficiently large to cope adequately with the disease and the reduction of funds has aggravated the situation.

The eradication of the cattle tick in the South continues to progress, the results in the different sections depending largely upon State, county, and local support. Fifty thousand five hundred and fifty-five square miles have been released this year from Federal quarantine, making a total of 509,080 square miles since the work was begun in 1906.

Foot-and-Mouth Disease.

In addition to the task of suppressing animal diseases in this country, the department is responsible for the protection of the live-stock industry against the introduction of nearly a score of serious foreign live-stock diseases. One of the most infectious and dangerous of these is foot-and-mouth disease, which exists nowhere in the United States at the present time, but is a constant menace because of the facility with which it may be carried by animals, hides, and various live-stock products. The importance of prompt action in eliminating any centers of infection whenever they develop emphasizes the necessity of providing an adequate "insurance" fund, available for immediate use. Such a fund, to be used only in case of actual outbreaks, has been carried in the Agricultural appropriation act for several years. The appropriation was reduced by $950,000 at the last session of Congress, leaving an amount which is entirely inadequate to cope with serious outbreaks. While, through good fortune, no outbreak has thus far occurred during the current fiscal year, it would certainly be the part of wisdom to make liberal provision for dealing with this dangerous disease whenever it appears, and the department, therefore, has recommended in its estimates for the fiscal year 1922 that the appropriation be restored to its former figure.

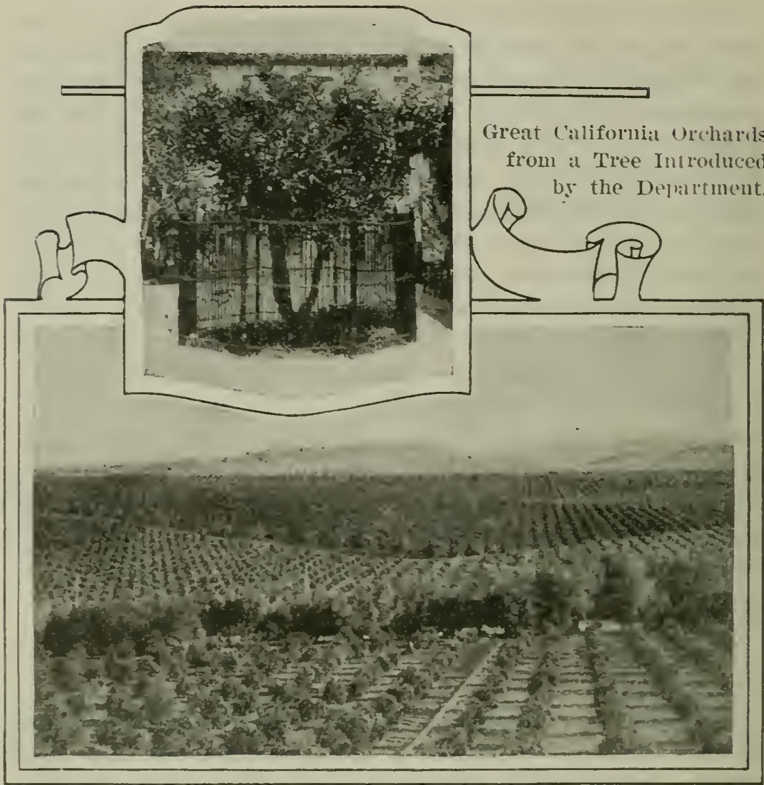
Improvement of Crop and Live-Stock Production.

The elimination or control of insects and diseases affecting both plants and animals, as well as of other limiting factors, is highly essential if we are to maintain our present agricultural production. But to increase the efficiency of our farms still further requires, among other things, the development of superior plants, the improvement of cultural methods and practices, and the breeding of better animals.

The development of improved crop plants, through breeding, selection, and in other ways, has almost limitless possibilities and has received a great deal of attention both from the Department of Agriculture and the State experiment stations. It is exceedingly difficult to state accurately, in terms of dollars and cents, the value of fundamental work of this sort, but unquestionably it is tremendous. The efforts to develop improved varieties of corn, which have been under way for 20 years or more, have probably increased production by one-fourth. Improved wheats have added greatly to the wheat yield, and it is only necessary to mention Marquis, Kanred, Early Baart, and the new wheats of the Washington Experiment Station to realize their importance. Better potatoes have been a great factor in the production of the crop, and new varieties at present under test indicate that they mark a notable advance. The development of early velvet beans multiplied the acreage tenfold in three years, and high-yielding superior lint cottons, such as Meade, Acala, Durango, Trice, and Columbia, are of inestimable value. The recently developed Victor cowpea is far superior to any previously known. Similar, but perhaps less striking, results have been secured with most of our important crop plants, and illustrate clearly what will, without doubt, continue to be a fruitful field of activity for a large corps of investigators.

Valuable New Plants Introduced.

A somewhat similar line of work is the search for and introduction, acclimatization, and adaptation of new crop plants. Some of the results in this field are spectacular, indeed almost romantic. Alfalfa, a native of Central Asia, brought into the Western States in about 1854, has become in a generation almost the basic crop of the West. The sorghums are the basis of the great agricultural development of the semiarid Southwest. Japanese rices, secured in 1899, were the foundation of the great rice industry of Louisiana and Texas. The Washington Navel orange, introduced from Brazil in 1872, makes up the bulk of the California orange industry, producing a crop valued at approximately $16,000,000 a year. Durum wheat, introduced in 1899 from Russia, now produces a crop worth $50,000,000 annually. Egyptian cotton, brought in by scientists of the department in 1901, has become the basis of a long-staple cotton industry in the Southwest valued at $6,000,000 in 1917, $11,000,000 in 1918, and $20,000,000 in 1919. The culture of dates in California and Arizona is already a thriving busi-



Great California Orchards from a Tree Introduced by the Department.

ness, which is expanding rapidly and will, in the near future, have impressive value. Sudan grass, introduced in 1909 from Egypt, is now worth over $10,000,000 annually. Feterita, secured in 1906 from Egypt, produced in 1918 a crop valued at $16,000,000. Over 1,000 varieties of soy beans have been introduced from China and other parts of the Orient. From these the experts of the department have, after careful tests, selected eight of the best varieties, which are now largely cultivated and are an important element in the very rapid increase in soy-bean production. Peruvian alfalfa, introduced in 1899, is by far the most productive and valuable variety for the Southwest.

The Search for Grasses.

Scientists are convinced that there are still great possibilities in the search for new crops, especially for plants that are cultivated little, if at all, in their native countries. Perhaps this is most strikingly exhibited in grasses, many of which have been introduced accidentally. Thus bluegrass, white clover, redtop, timothy, and many others which came originally from Europe make up nearly all the grass lands of the north; and Bermuda grass from India, carpet grass from the West Indies, Dallis grass from Argentina, and lespedeza from Asia have performed a similar rôle in the South. California's pastures consist mainly of species from the Mediterranean region, such as alfilaria, bur clover, wild oats, wild barley, and numerous others. There are undoubtedly in Central Asia many species which, if properly selected and introduced, will add greatly to the carrying capacity of the western ranges, aside from what can be accomplished by rational range management. From this region came alfalfa and sweet clover, both important in the West. There is every reason to believe, also, that good grasses and legumes can be found for the cutover lands of the South, and thus prepare the way for the further development of the livestock industry in that section. It is impossible to bring in new grasses or other valuable crop plants from remote and almost inaccessible parts of the world without sending properly trained explorers, and larger funds for this work are needed.

Improved Cultural Methods and Practices.

Better tillage and rotations, more rational irrigation, judicious fertilizing, the greater use of legumes, and proper attention to farm layout, distribution of labor, choice and care of farm machinery, and timeliness of operations, all these make for larger yields and consequently reduced costs of production. Our scientific understanding of these matters is far from adequate. Recently it has been discovered that prompt plowing under of the wheat stubble will completely destroy the Hessian fly and the joint-worm, both serious enemies of wheat. This points to the desirability of a radical change in the ordinary corn-belt rotations. On the other hand, until a rotation that is as good or better can be developed by field investigations, it is manifestly unwise to urge a change. The best rotations are organized around one or more legume crops. It is altogether likely that the failure to secure the full benefits of improved varieties of corn in the corn belt, in spite of increased use of fertilizers, is associated with the steady decline of the acreage of red clover. The restoration of red clover to its former acreage, or the finding of some other satisfactory legume, is of outstanding importance to the Middle West. Unfortunately, the facilities of the department for carrying out these long and costly investigations to develop better rotations are wholly inadequate.

Effect of Daylight on Plant Growth.

A striking and important discovery, made recently by the department, is that plants are remarkably sensitive to changes in the duration of the daylight period, even when all other factors are kept constant. It now seems probable that all regular periodic changes in plants, such as time of blooming, fall of the leaf, the resting period, etc., are naturally regulated by the duration of daily light. This discovery explains many plant reactions that have long puzzled investigators, such as the totally different behavior of a plant in widely different latitudes. Thus, by regulating the length of daily illumination, violets can be made everblooming and poinsettias can be forced to bloom in midsummer. The discovery undoubtedly will be of much value in greenhouse culture, and furnishes the explanation of a number of plant reactions that occur in the field. Hereafter, it must be taken into account in all accurate experimentation with plants.

Improved Types of Live Stock.

The breeding and development of improved types of animals offers possibilities at least equal to those involved in the breeding and selection of better crop plants. The campaign now under way for "Better Sires—Better Stock" is producing excellent results. Its purpose is to bring about the elimination of scrub stock from our herds, thus increasing their producing capacity. It costs as much to raise a poor animal as it does a good one, and more to keep it, so that better live stock makes for increased production and greater profits. The improvement which can be made in a herd with a pure-bred male is startling. If a pure-bred sire is kept throughout, the first generation would be one-half pure blood, the second three-fourths, the third seven-eighths, the fourth fifteen-sixteenths, and the fifth thirty-one thirty-seconds, or practically pure bred.

A concrete example of the importance of quality may readily be estimated from the slaughter records of animals. In converting cattle into beef, for example, the present average dressing percentage is 53½. Poor breeding, without doubt, is a prime cause of this low percentage. Suppose our efforts to improve cattle should, within a reasonable time, raise the general dressing average only 1½ per cent—that is, to 55 per cent—what would be the resulting increase in beef? On the basis of a total annual production of 7,000,000,000 pounds, which is the average dressed-beef production for the last two years, the increase would be 200,000,000 pounds a year. This is far from being a negligible quantity; in fact, it just equals our average annual exports of beef products for the last 10 years, including, of course, the war period.

Build Up Our Dairy Herds.

Pure-bred or grade dairy cows frequently earn for their owners from 25 to 100 per cent more than the returns received from scrubs. In a typical case, heifers sired by pure-bred bulls surpassed their dams, which were ordinary cows, by 64 per cent in milk production and 52 per cent in butter fat. The second generation produced more than twice as much butter fat and milk as the original animals. The United States holds sixth place among 14 prominent countries in the average yield of milk per dairy cow, being excelled by the Netherlands, Switzerland, Denmark, Germany, and Canada. Our ability to produce scores of cows which yield more than 20,000 pounds of milk a year is ample proof that our national production of less than 4,000 pounds per year per animal is, in the last analysis, a reflection of inattention and average lack of applied skill. The dairy cow is a good example—probably the best—because her production is so readily measured and because there is so much uniform evidence in various countries. But the same principle and similar facts apply with equal force to horses, hogs, sheep, poultry, and other farm animals.

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The experimental and other work of the department, having for its purpose the development and improvement of our live stock, covers a wide range., including dairy farming, hog raising, horse breeding, beef production, sheep raising, poultry production, methods of feeding under regional conditions, and the general principles of breeding and heredity. This work is of fundamental importance and should be further developed.

Utilization of Surplus and Waste Products.

Along with the work of controlling diseases and insect pests, of introducing and developing better plants, of working out improved cultural methods and practices, it is essential that processes be worked out for converting perishable farm products into commodities which can be carried from the season of plenty to the season when they are actually needed. The fact that they can not now be so carried frequently results in the marketing at one time of larger quantities than can be disposed of profitably, and demoralization of the market follows, with consequent loss to the farmers. Industries founded upon the utilization of surplus farm products would be of tremendous value in meeting this problem.

The Bureau of Chemistry has accomplished some important results along this line in recent years. On the basis of its investigations, for example, there has been developed a citrus by-products industry for the utilization of cull and surplus oranges and lemons. It has also discovered a feasible method of utilizing corncobs, which always have been a waste product, so that their entire content can now be made into highly useful articles. The experts of the bureau have produced from corncobs a large yield of adhesive suitable for pasting container box board. After this is removed, a considerable quantity of a lower grade product can be made, and the residue is practically pure cellulose, which can be used in the manufacture of a number of commodities, including a good quality of paper when mixed with a suitable quantity of wood pulp. After the processes for recovering all these articles had been worked out, it was discovered that a considerable quantity of a very valuable chemical—furfural—was formed, and methods of recovering it have been developed. Furfural is a basic intermediary in dye manufacture and, in addition, has great possibilities as a solvent and a substitute for formaldehyde in the manufacture of plastics. Many other similar lines of investigation are actively under way, but these two illustrations clearly indicate what can be done toward opening up new industrial outlets for agricultural products.

Office of Development Work.

It has been found, however, that the benefits of the important discoveries made by the scientists of the Bureau of Chemistry are not always fully realized. The difficulty is that of bringing about their commercial development. In order to meet this situation, there has been established in the bureau an Office of Development Work, the function of which is to aid in bringing the discoveries to the attention of business men and others. When new processes have passed the experimental laboratory stage, it becomes the duty of this new office, which is conducted by engineers rather than chemists, to investigate their commercial value and the cost and method of placing them on a commercial production basis. Efforts then will be made to inform manufacturers and business men regarding the opportunities for them to develop facilities for the utilization of the discoveries, so that the people of the country may secure full benefit of them.

The Agricultural Extension System.

The broad development of the national system of cooperative extension work in agriculture and home economics under the provisions of the act of May 8, 1914 (Smith-Lever Act), is one of the most notable events in agriculture in recent years. When this act went into effect, approximately 900 counties had the services of an agricultural agent and 275 the services of a home demonstration agent. There are now 2,000 agricultural agents and 800 home demonstration agents, in addition to 300 county leaders of boys' and girls' club work. Perhaps the most striking evidence that farmers are heartily supporting the extension service is found in the fact that this year the contributions from county sources alone aggregate $4,780,000, compared with $780,000 in 1914.

There are still 650 rural counties which have no agricultural agents, 1,800 are without home demonstration agents, and only a small proportion of the farm boys and girls are being reached through the club work. The desirability of completing this great system of practical education as rapidly as conditions warrant can not be questioned. There has been a great increase in the cost of travel, supplies, and, in fact, of everything required in the operation of the system, since the Smith-Lever Act was passed, and an increase of available funds each year for a number of years will be necessary if we are to reach the goal within a reasonable time.

Work in Behalf of Farm Women.

With the spread of extension work among farm women, it has become increasingly necessary to have definite information regarding their needs and wishes, in order that the extension forces may cooperate effectively with them. The States Relations Service, therefore, undertook to make a survey, through the home demonstration agents, of 10,000 farm homes in the northern and western States. The results of the survey have been compiled and published. In brief, they show that, while there has been considerable progress in lightening the burdens of farm women and making the farm home life more satisfactory and attractive, through the introduction of labor-saving devices, improvement of farm sanitation, free mail delivery, telephones, automobiles, and the like, very much more needs to be done before the mass of farm women will have even the advantages now possessed by a limited number.

Wherever it has been in operation, the system of county home demonstration agents has proved to be the most helpful agency dealing with the problems of the farm home. It should be expanded, therefore, as rapidly as funds and facilities permit. Country life has many advantages, but they can not be sufficiently enjoyed without constant improvement in the living arrangements on the farms. We can not afford to delay bringing assistance to the farm women in solving their present pressing problems.

Home Economics.

In order that the home demonstration agents may render the most effective service, there must be a constant addition to the fund of scientifically ascertained and tested knowledge in the field of home economics. So far, research along this line has proceeded slowly and in a small way. The Office of Home Economics of the department is the largest single organization devoted to such work and has made many important contributions to our knowledge on home economics subjects. It can not prosecute its activities on an adequate scale, however, because of the lack of funds. The success of our newly established system of vocational education in home economics, provided for by the Smith-Hughes Act of 1917, as well as of the home demonstration work, depends in no small measure upon the maintenance of adequate agencies for home economics research.

Publication and Information Work.

The organic act creating the Department of Agriculture not only directs it to "acquire" useful information on subjects connected with agriculture in the most general and comprehensive sense of the word, but also to "diffuse" such information among the people of the United States. To meet this responsibility, increased attention has been given to the strengthening of the publication and information activities of the department. The first step involved the consolidation, in the Division of Publications, of all publication and information functions serving the department as a whole. This necessitated the transfer of the Office of Information, the Office of Exhibits, and the Office of Motion Pictures from the Office of the Secretary, combining under one administrative head these three related activities with those of editing, printing, and distribution. The next step was the designation of a Director of Information, whose duty it would be to exercise general supervision over all the publication and information activities of the department, both in Washington and in the field, and to bring about the closer correlation of such activities in the various bureaus with those of the Division of Publications. The advantages of this reorganization are apparent not only in more efficient administration and supervision but in the more complete coordination and concentration of effort.

The department is in a better position than ever before to serve the public in this important field of its work. The responsibility resting upon it is clear. It is its duty to keep the public informed regarding the results of its investigations and experiments and the administration of the various regulatory statutes entrusted to it for enforcement. Under existing conditions, however, it is compelled to reservoir much valuable information which should be made available to the public. At one time during the past year, there were 267 important manuscripts which it was necessary to withhold from publication because of the lack of funds for printing. A deficiency appropriation relieved this situation somewhat, but there are still on hand many valuable manuscripts which can not be published. This situation should not be permitted to continue, as criticism is frequently made that the results of investigations, in many instances, are published too late to be of the greatest service. Some of these manuscripts represent the life work of capable, practical, scientific men, and we should not fail to give the public promptly the benefits of their years of labor.

Distribution of Farmers' Bulletins.

Furthermore, the department is falling far short of meeting the demands for its publications. The law provides that one-fifth of the number of Farmers' Bulletins printed shall be available to the department, while the Congress is allowed four-fifths for distribution by its Members. The department has intimate knowledge of the needs of the country for agricultural information, and it has also an effective field organization capable of distributing its publications where they will serve the most useful purpose. It would seem desirable, therefore, to change the present arrangement so as to charge the department with the distribution of Farmers' Bulletins to the sections where the information they contain is most needed and desired.

The Agricultural Experiment Stations.

In many of the States the institutions for agricultural research which are maintained by Federal and State funds are seriously hampered by existing conditions. Their appropriations have not been increased sufficiently to meet present economic requirements, their expert forces are being depleted by attractive offers from commercial and other concerns, and it is increasingly difficult to fill the vacancies thus created with equally competent men and women. With the increased cost of services, labor, equipment, and supplies it has been impossible for them to maintain their prewar status in the field of research.

The situation is serious enough to deserve careful attention of all those interested in the progress of our agriculture. The research work of the stations, like that of the Department of Agriculture, is fundamental. Unless there comes from these institutions a steady and abundant flow of new knowledge which can be utilized to meet pressing problems, agricultural advancement will slow down and our system of agricultural education, through colleges, schools, and the extension service, will deteriorate.

Nitrogen and Potash.

The European war emphasized the fact that no effort should be spared to establish national independence in the production of fertilizer materials. This is especially true in the case of nitrogen, which is not only a valuable fertilizer ingredient, but an essential element in the manufacture of munitions. Of all the nations involved in the war, Germany alone had a sufficient nitrate supply within her borders, but England, France, and Italy are now rapidly perfecting plans to make themselves equally secure in this respect. Increased interest has been manifested in this country also in the study of methods for fixing atmospheric nitrogen, and the Department of Agriculture, through the Bureau of Soils, has actively cooperated with the War Department in this important field. The production of ammonium sulphate from by-product coke ovens and gas plants has greatly increased, but not sufficiently to meet the demand for fixed nitrogen.

The nitrogen fixation plant at Muscle Shoals, Ala., completed shortly before the armistice, offers a hope for an independent source of nitrogen for fertilizer use in time of peace. This plant is prepared to make calcium cyanamid, or, by some additions, to manufacture ammonium sulphate. With modifications, also, it may be equipped for the preparation of highly concentrated fertilizer materials which will be free from filler, and therefore result in a considerable saving to the consumer in freight charges. The plant is still idle, awaiting the necessary authority from the Congress for its operation. It is hoped that the matter will receive consideration at the next session of the Congress, and that the requisite authorization will be granted without further delay, in order that the Nation may escape, once for all, from dependence upon foreign nitrate fields, and that an adequate supply of nitrogen may be developed, both as a protection in times of national stress and to meet the growing demand for this valuable product for fertilizer purposes.

Potash from Kelp and Other Sources.

The experimental kelp plant at Summerland, Calif., the purpose of which is to demonstrate the practicability of extracting potash and useful by-products from the giant kelps, is in active operation and valuable results are being secured. Unquestionably, it will be possible, when the best methods have been worked out, to develop a potash industry on the Pacific coast capable of supplying a considerable part of the Nation's needs.

Two processes for the recovery of potash from certain rocks have recently been developed by the Bureau of Soils, and both are being utilized in commercial practice. The 87,000 tons of potash annually lost from flues and stacks of cement plants are still, in the main, going to waste. Only about 1 per cent was recovered in 1919. A similar situation exists with reference to the collection of potash from blast furnaces. The department is now making a survey of this situation, and preliminary results show that the dust from blast furnaces is higher in potash content than the cement dust and that it can probably be recovered more economically. The potash that escapes from these two sources would, if collected in marketable form, go a long way toward meeting the normal potash requirements of the country. There is ample justification, therefore, for the appropriation of sufficient funds adequately to study those phases of the problem which properly come within the scope of this department's activities.

Meteorology.

Meteorology is coming into wider application in agriculture, commerce, and navigation, and the rapid development of aeronautics has opened up for it a very broad field. As a result, greatly increased demands, which it has been difficult, and in many cases impossible, to meet, have been made upon the Weather Bureau. The growth of the Nation places upon the bureau new obligations, and appropriate recommendations have been included in the estimates for the strengthening of its work, especially its studies in aid of aeronautics, so that it may be in position to meet the responsibilities imposed upon it by law.

The Progress of Highway Construction.

It required a great national catastrophe to awaken the American public to the inadequacy of our transportation facilities and to the fact that we must depend largely upon our highways, in conjunction with motor vehicles, when a sudden expansion in transportation is essential. Our experiences during the last three years have clearly demonstrated that the failure earlier to inaugurate a sound road improvement program has retarded the effective development of one of our most vital national requirements. The use of the motor vehicle for highway transportation has increased tremendously within a short period. In 1906 only 48,000 motor vehicles were registered in the United States. By 1914 the number had risen to 1,700,000, while the registrations now total nearly 8,000,000, exclusive of motor cycles. The actual vehicle-mile use of our roads, it is estimated, has increased more than 500 per cent in strictly agricultural communities and more than 1,000 per cent near the larger centers of population. These figures indicate the extent to which community and short-haul transportation will be served by better highways.

Great Highway Program Under Way.

The Federal-aid road act of 1916, as amended, has resulted in putting in motion a great program of highway development, nation wide in its extent. The original act appropriated $75,000,000, extending over a five-year period, for the construction of rural post roads in cooperation with the States, and $1,000,000 a year for a period of 10 years for the building of roads within or adjacent to the national forests. It soon became apparent, however, that the sums apportioned to the various States on the basis prescribed by the act would not be sufficient to provide for the building of any considerable mileage of the more durable types of roadways such as the traffic conditions in a large number of the States demanded. After the signing of the armistice, the feeling was prevalent that there might be a period of business inactivity leading to a surplus of available labor and that a large program of road construction would be very helpful in meeting the situation. The Congress, therefore, acting upon the recommendation of the Secretary of Agriculture, amended the act, in February, 1919, by providing an additional appropriation of $200,000,000 for rural post roads and $9,000,000 for national forest projects, and by broadening a number of its provisions.

Projects Approved and Completed.

In view of the abnormal conditions which have prevailed since the summer of 1916, the progress that has been made in placing a large highway improvement program under way is surprisingly good. In the three years, 1917, 1918, and 1919, there were approved 677 projects, calling for the construction of 5,790 miles of road and involving a total cost of $56,418,673, of which the Federal share was $23,931,618. During the fiscal year 1920, 1,670 projects submitted by the States, involving the improvement of 16,670 miles and a total allotment of $109,830,366 of Federal funds, were approved. At the end of the year, 14,940 miles of Federal-aid roads, on which $103,925,094 of Federal funds had been allotted, were under consideration and in various stages of completion, while 1,677 miles had been entirely completed.

Preliminary engineering investigations have been made on 4,003 miles of forest roads and construction has been completed, or is in progress, on 1,300 miles.

Construction Difficulties.

The work of actual construction has suffered from several causes, which varied in intensity in the different States. They include: (1) The difficulty of securing transportation facilities for road materials. During the season of 1920 the assignment of open-top cars for transporting coal resulted in tying up and slowing down many of the highway projects under construction. (2) The lack of materials, particularly cement, steel, and culvert pipe. In general, the short supply of sand, gravel, crushed stone, and other similar materials has been due to transportation difficulties rather than to a shortage of production. (3) The lack of available contractors and labor. This condition was not general, however, and was partially caused by the unwillingness of contractors to undertake new contracts rather than to an actual lack of sufficient organizations. (4) Difficulties experienced in disposing of road bonds. This situation existed only in certain States and was due largely to the advance in interest rates generally after the rates for the bonds had been fixed.

There have been other difficulties, but these are perhaps the most important, and it is clear that they relate to matters over which the Federal and State highway departments have had little or no control. It has become more and more apparent that the physical tasks involved in the building of highways are so great that, for a considerable period, progress will be greatly hampered by economic limitations. On the other hand, it is equally apparent that the rate of progress will be accelerated as conditions gradually become more normal. Even under the existing handicaps, a large mileage of highways is being completed. All details of engineering and administrative procedure which have been responsible for any slowing up of the work have been carefully studied, and, as far as practicable, changes designed to eliminate the causes have been made. As a result, the preliminary operations can now be carried on much more rapidly than the actual construction.

Advisory Board of Highway Officials.

In order to provide for the full correlation of the work of the department and of the State highway agencies, the advisory board has been enlarged to include all the members of the executive committee and the officers of the Association of State Highway Officials. There is thus available to the department, in formulating administrative policies, the advice and experience of the State executives in actual charge of highway work, representing all parts of the country. The board functions through correspondence and periodical meetings with the Secretary of Agriculture and the Chief of the Bureau of Public Roads. One very vital question now under consideration by it relates to the classification of highways into groups or systems of like importance. This matter is fundamental to the future of highway development. Only through a carefully prepared building plan can the work of the several highway agencies, from year to year, be placed on a systematic basis, a basis that will provide systems of highways so developed and connected that all classes of traffic will be adequately served. We can not ignore the fact that the actual construction of highways will be limited by physical factors for some years to come, and it seems clear that the only sound policy to follow, in the circumstances, is that of building roads in the order of their economic importance.

Highways, as a general rule, are local institutions, and they must, first of all, carry the traffic originating in the immediate vicinity. Their normal function, therefore, is the short haul, connecting producing areas with rail shipping points and near-by markets. But we should classify our highways, and then follow the classification persistently, to the end that, as the principal roads in each State are completed, they will connect with those of contiguous States and thus automatically become links in a national system which will serve all parts of the country. In working out such a classification, due consideration must be given to the military needs, and provision, therefore, has been made for cooperation with the War Department in making an extensive study to determine the roads which are needed to meet them.

Technical Problems to Be Solved.

With the great increase in the number of vehicles using our highways, and particularly with the greater weight of the traffic units which they are now expected to carry, many technical problems in highway construction have arisen. The solution of these problems is essential to the wise expenditure of the large sums that have been provided for construction operations. They can only be solved by painstaking and thorough investigations and studies. Plans have been worked out, therefore, for the prosecution of the necessary research work, in cooperation with the National Research Council and with educational institutions which have the requisite facilities.

Provision for Five-Year Program.

The rapid improvement in the organization of the Federal and State highway departments, the development of adequate road legislation in the various States, the response of the States in making funds available to meet the Federal apportionments, and the progress of construction work during a period beset with every possible discouraging condition and limitation have clearly demonstrated the soundness of the existing Federal aid plan. Future legislation should not disturb the principles embodied in the act of 1916, which have been tried out and found to be so satisfactory, and only those changes should be made which experience has clearly shown to be desirable.

The period covered by the original act, as amended, will terminate with the close of the present fiscal year. Immediate consideration, therefore, should be given to plans for its extension. In order that there may be no halting in the work, it is hoped that the Congress will, at its next session, provide additional funds, to be expended under the terms of existing legislation with certain modifications, at the rate of $100,000,000 a year for a period of five years, beginning with July 1, 1921. The principal modifications in mind relate to the problem confronting the Western States in highway work because of the existence in many of them of large areas of public lands, and to the maintenance of Federal aid roads by the State highway agencies rather than by the counties. The Association of State Highway Officials, at its meeting in December, 1919, unanimously approved the continuance of the present plan of Federal participation in road building with these and other modifications.

The fact that the present appropriation may not be entirely expended by June 30, 1921, does not lessen the necessity of immediate action. Both the Federal and State highway departments should know, as promptly as possible, the program for the next five years, in order that the work may be adequately planned and the engineering and administrative details carefully executed. Forty of the State legislatures will be in session this winter, when it will be necessary for them to make the requisite provision for meeting future Federal apportionments. From every standpoint, therefore, it is essential that legislation for the continuance of the program now under way be promptly enacted.

National Forest Roads.

Provision should be made also for the continued building, on an adequate scale, of roads within or adjacent to the national forests. The forest road systems are very closely related to those of the States, and the major forest projects form important links in essential State and interstate highways. There are approximately 15,000 miles of roads within the forests which connect with State and county highway systems. The building of forest roads, therefore, is an important part of the general road development plan of the West, both within and without the forest areas. In addition, the transportation of forest products, the protection and administration of the forests themselves, and their utilization for recreational purposes are all dependent upon the construction and maintenance of serviceable roads.

The Forestry Problem.

The time has arrived when increased attention to a sound and comprehensive forestry policy is imperative. Forest depletion has reached a dangerous and critical point. As cutting advances, much of the land which should continue to produce ample quantities of timber for our domestic needs, and also a balance for export, either grows inferior or partial crops, or sinks to a condition of virtual waste. The cause is neglect and should be removed. It can be removed only by public action.

Cooperation With the States.

The broad question of timber supplies and permanent forests is a national one. It can not be handled piecemeal by uncorrelated local agencies. Neither can it be handled through an inflexible system imposed without regard to local conditions. The recognized police powers of the several States should be brought into play to stop forest fires and prevent the devastation of privately owned forest land. At the same time, the Federal Government should take an active part in aiding the forest activities of the States, in standardizing technical requirements as between the States, and in extending the national forests. But the public should not be expected to bear the entire burden. Responsibility rests upon the forest owner to comply with equitable requirements designed to keep employed in growing timber lands which are not needed for agriculture.

The Congress will be asked to provide an appropriation sufficiently large to permit the department to cooperate effectively with all the States which are prepared to work with it in preventing and controlling forest fires and other causes of devastation. It will be requested, also, to provide funds for the reforestation of devastated lands within the national forests, and for additions to them through further land purchases and through exchanges of national forest areas or timber for private lands of equal values.

Forest Experiment Stations Needed.

Full productiveness of our forests can not be secured without full information regarding the means of controlling their growth. Unfortunately, at a time when better knowledge is particularly urgent, the machinery for obtaining it has been seriously curtailed as the result of decreased appropriations. One consequence of this has been the virtual abandonment of the forest experiment stations in the West, at which many of the most important investigations were centered.

The number of these stations should be increased, not reduced. They are as necessary to forestry as the agricultural experiment stations are to progress in agriculture, and there should be at least one station in each of the main forest regions of the country. Economic studies dealing with the prospective requirements of the various industries, and, in general, with the demands which the forests of the country should be prepared to meet, also are essential. In the face of enforced curtailments in the use of wood, due to the depletion of present supplies, it is as important to study methods of economically and effectively using what we have as it is to learn how to grow more wood. Work along all these lines should be greatly enlarged and the necessary funds should be provided for the purpose.

In administering the national forests, the department has been carrying on an expanding business through a period of rapidly rising prices with an almost stationary appropriation. This has made it necessary to practice the most rigid economy. It is impossible to handle the forests efficiently on the basis of the prewar appropriations, and the protection and development of these resources should not be restricted for lack of men to handle the work involved.

National Forests and National Parks.

For many years the movement for setting aside from the public domain permanent reservations of wild lands as national heritages failed to recognize any substantial difference between national parks and national forests. As regulated use of the timber and grazing resources of the forests developed in importance, however, a clear distinction of fields began to appear. The forests, in the nature of the case, must always have an important value as recreation grounds, and must be administered with definite provision for recreational use along with the development and use of their material resources. Areas of scenic grandeur or natural wonders which are exceptional in character should be incorporated in national parks, but for every area of this sort there are literally hundreds of mountain peaks, lakes, or beautiful canyons within the forests which do not justify their designation as parks.

This situation must be recognized in seeking a sound basis for determining what areas should be incorporated in national parks. If their primary public utility arises from economic resources for which, sooner or later, there will be a legitimate demand, they should not be embraced in parks. As our Western States expand in population and industry, it will not be possible to withhold the parks from demands for water power, for irrigation, and, indeed, for timber and forage, unless they are limited to areas in which the beauties and wonders of nature are, in reality, so dominating that they justify prohibition of conflicting forms of use. Above all, the national conception of our great parks as areas so fine and wonderful that they belong to the whole country should not be cheapened by making them simply a means for local development or advertisement.

Nor should we build up, under the name of national parks, public properties which are open to various forms of commercial exploitation and which are, in fact, merely national forests under a different designation. Areas whose dominant public values are economic do not belong in the parks. They should remain or be placed in the national forests if they serve the primary functions of the forests—the production of timber or the protection of watersheds. On the other hand, the economic service rendered by the forests should be no bar to the administration of small areas at many points within them for public recreational purposes or for the protection of their natural beauty. There is a growing demand for summer-home sites, for public camp grounds, for the development of community recreation areas in the forests, and for other forms of recreational use. To meet this demand, there should be more specific provision than has yet been made for the administration of the recreation resources.

Grazing Fees.

Grazing at present is the principal source of money return to the Government from the national forests. Since 1915 the grazing fees have been doubled, with the view of making them commensurate with current rental rates for neighboring private lands of the same character. When the existing rates were established, the users of the range understood that

Counting Sheep Onto a National Forest Range.

A careful count is made of the live stock that grazes on National Forest ranges. As many stock are allowed on each range unit as will utilize all the forage without injuring the range.

they would remain in effect for five years and many of the grazing permits were issued for this period. The value of the grazing privilege on many ranges subsequently advanced, and a considerable sentiment in favor of an immediate further increase in the fees developed. The good faith of the Government would be impaired by such a course. Furthermore, to advance the fees at the present time would add to the instability of the national forest live-stock industry which has been brought about by existing market conditions, and would be neither just nor good public policy.

No policy has been laid down by the Congress for the guidance of the department in the exercise of the administrative discretion, with which it has been vested for 15 years, to determine the conditions under which the use of the range may be permitted. If the Congress desires to prescribe such a policy, it should not take effect until after 1923, when the existing leases will expire. Even in the absence of legislation, the department will make a classification of the ranges and fix a new scale of charges, to be imposed in 1924, under which the fees will represent the actual grazing value of the particular portion of the range used by each permittee or group of permittees. Before the new scale is determined, an opportunity will be given the local associations of national forest range users to submit any data regarding the fairness of the proposed fees which they may desire to present.

The Development of Alaska.

The Department of Agriculture, in common with a number of other departments, has very definite responsibilities in connection with Alaskan development. It is endeavoring, for example, to increase the production of crops and live stock; it has experts in the field investigating the possibility of building up the reindeer herds into an important source of meat supply; it is giving attention to the perpetuation of the fur industry. But its chief responsibility at the present time is in connection with the administration of the national forests in Alaska.

The location of pulp mills in these forests would aid greatly in solving the problem of our future supplies of newsprint. Under regulated use, the Tongass National Forest alone can probably produce forever 1,500,000 tons of newsprint yearly, along with ample quantities of timber for local purposes. By far the most valuable timber in Alaska is that which fringes its western seaboard, the northward extension of the coast forests of Washington and British Columbia. Practically all this coastal area is owned by the Government. It is under national forest administration, and timber from it is already playing an important part in the industrial development of the Territory. Every sawmill on the coast from Ketchikan to Seward obtains its supply from the national forests. These mills furnish nearly all the lumber used in the region, and forest administration is intimately related to every form of industry and to every community in the coastal area.

Responsibility of the Forest Service.

Because of this relation, a peculiar responsibility rests on the Forest Service in Alaska. To fulfill it effectively under a system of long-range administration is impossible. The public resources in Alaska can be properly managed only by lodging authority in men on the ground to act without waiting to consult distant superiors, and the Forest Service has consistently followed this policy. There is close cooperation between the Forest Service and the Territorial government, and the animating purpose of the forest officers is to make the forests serve the welfare of Alaska.

The greatest need of Alaska is for the investment of capital in enterprises for the development of resources which can be developed in no other way. The pulpwood supplies of the coast forests offer the best immediate opening for capital. To the task of securing their utilization on a large scale, the energies of the Forest Service are now being directed, with every promise of success. One large sale has already been closed and others are in prospect. Through such enterprises the population of the Territory will be built up, its wealth increased, and other forms of development stimulated.

Amendments to Existing Legislation.

In the early history of the Department of Agriculture its work was directed largely along the lines of research and education. In recent years, its activities have been expanded to include the administration of various regulatory laws relating for the most part, directly or indirectly, to agricultural commodities or operations. Some of them, such as the meat-inspection act, and to some extent the food and drugs act, are designed to protect the public health. Others have for their object the protection of the live-stock industry by controlling or prohibiting the shipment of diseased animals in interstate commerce, the prevention of the entry into this country or the spread of injurious insects and plant diseases, or the conservation of our game birds and animals. Still others are intended to facilitate the marketing of farm products or to prevent abuses in the preparation and shipment of foods, drugs, insecticides, and fungicides, and of virus, serums, and toxins for combating animal diseases. Long experience in the administration of these laws indicates that many of them should be strengthened if they are to serve most effectively their original purposes and to meet new situations which have arisen since they were placed on the statute books. Appropriate recommendations regarding the necessary amendments will be submitted to the Congress at its next session; I will merely outline them here.

The Meat-Inspection Act.

The meat-inspection act has been in operation 14 years and certain changes in it are clearly desirable. Authority should be given to require that carcasses and parts of carcasses, meats, and meat food products shall bear labels which will correctly indicate their kind and character. An amendment to this effect would go far toward preventing fraud and deception, because purchasers would then have exact information as to what they buy. The existing doubt as to whether the law applies to shipments from a State to a Territory or to the District of Columbia, or vice versa, should be removed. In order to maintain a prosecution for the shipment of unsound meat, under the act as it now stands, it is necessary for the Government to show knowledge on the part of the shipper as to its unwholesomeness at the time he offers the product for shipment in interstate commerce. This requirement should be eliminated.

On account of the peculiar construction of section 21 of the act, there is some question as to whether the prohibition contained in it regarding the interstate transportation of unwholesome meat and meat products applies only to farmers, retail butchers, and retail dealers. There is also doubt as to whether the element of sale is necessary in order to constitute an offense under this section. These ambiguities should be corrected, and amendments should be inserted which would effectively prohibit the interstate shipment for food purposes of articles which become unsound subsequent to inspection, as well as traffic in unsound meats by persons who conduct their own transportation.

Specific authority should be provided for the withdrawal of inspection from establishments which violate any of the regulations promulgated for the enforcement of the act, since the conditions prescribed by them are necessary to insure the wholesomeness of meat and meat food products designed for interstate shipment. Wherever the words "Inspected and Passed" and "Inspected and Condemned" appear in the statute they should be changed to read "U. S. Passed" and "U. S. Condemned," respectively, in order to distinguish the Federal inspection marks from those of State and municipal authorities; and wider discretion regarding the disposition of fats and meat food products condemned for causes other than disease should be given, so as to permit their utilization for industrial purposes under proper regulations. The department also should be authorized to follow and reinspect products bearing the Federal mark of inspection after they have left the official establishments in which they were first examined and to cancel the marks if it is found that the continuance of their use would be misleading or an instrumentality of deception or fraud; and paragraph 545 of the tariff act of October 3, 1913, which now prohibits the importation of the classes of meat covered by the meat-inspection act except under conditions prescribed by the department, but which provides no penalty for its violation, should be reenacted as a part of the meat-inspection act, thus bringing it under the general penalty provisions. Other amendments of equal importance should be made, and a full statement of them will be presented to the Congress.

The Virus-Serum-Toxin Act.

In the case of the virus-serum-toxin act, a number of amendments are desirable in order more effectively to prevent the preparation and shipment in interstate and foreign commerce of virus, serums, and toxins which are worthless or contaminated. The law should be extended to cover articles which enter foreign commerce, and definite provision should be made for the destruction of worthless, contaminated, dangerous, or harmful products. Specific authority should be given to withhold the issuance of licenses to persons who refuse to permit inspection of their establishments, or to conduct them in accordance with the regulations, and a violation of the regulations at any time should be declared to be sufficient cause for the revocation or suspension of a license. It would be desirable, also, to provide that a license may be suspended temporarily, in critical cases, without the necessity of affording an opportunity for a hearing, and that all containers must bear the name of the product, the date of its manufacture, and such marks or labels as will clearly identify it and indicate its potency. The counterfeiting or falsifying of identification marks prescribed by the regulations should be prohibited; the shipment of samples of virus, serums, toxins, etc., intended for scientific purposes should be permitted under properly controlled conditions; and the acceptance of any money or gift by an inspector connected with the enforcement of the act, or the giving or offering of anything of value to an inspector by a licensee, should be made a criminal offense, punishable by fine or imprisonment.

The Food and Drugs Act.

In order to secure the more effective and efficient enforcement of the food and drugs act, the department should be specifically authorized to establish standards of strength, quality, and purity for the articles subject to its provisions, and ample power should be given it to enforce compliance with these standards. The term "drugs," as defined in the act, should be broadened to include specifically all cosmetics, toilet preparations, face creams, hair dyes, and antifat and antilean remedies; and all drugs containing methyl alcohol, for internal or external use, should be deemed to be adulterated, although the use of methyl alcohol in their preparation should be permitted, provided it is completely eliminated from the finished products. The list of habit-forming drugs set forth in the second paragraph of section 8 is incomplete and should be extended to include, by name, a number of dangerous substances commonly found in drug preparations; or, as an alternative, a definite requirement should be incorporated in the law that all habit-forming or poisonous drugs, or their derivatives, must be declared on the labels or packages. Virulent poisons should be brought within the scope of the act, and authority should be given to determine, from time to time, what substances shall be regarded as virulent poisons. The department should have power to inspect establishments in which foods or drugs are prepared for interstate or foreign commerce, or for sale in the District of Columbia or the Territories, in order to ascertain whether the articles are adulterated or misbranded; and the misbranding provisions of the act should be extended to food containers so made or shaped as to be likely to deceive or mislead the purchaser as to the quantity, quality, size, or origin of their contents.

The Insecticide and Fungicide Act.

The insecticide and fungicide act should be amended in several particulars. A substantial minimum fine should be provided, because, in the absence of any stated minimum, fines are sometimes so small that offenders consider prosecution as a matter of small moment. Certain inconsistencies in the definitions of the two words "fungicide" and "insecticide" should be cleared up, and the doubt as to whether "fungicide" was intended to include disinfectants and antiseptics should be removed. The term "misbranded" should be extended to cover false and misleading statements, designs, etc., in the circulars or in the advertising matter accompanying packages of insecticides and fungicides, as well as the statements upon the package or label itself, and the misbranding provisions should be made clearly applicable to inert substances which do not of themselves, or in combination with other ingredients of the particular article, prevent, destroy, or repel insects or fungi.

The Grain-Standards Act.

The act prohibits (section 4), under penalty, the interstate shipment of grain by grade from or to an inspection point unless it has been inspected and graded by a licensed inspector. It also forbids (section 5), but without a penalty, the representation of any grain as of a grade other than that shown in the certificate issued under the act. As a result, a person who ships or sells grain by grade without the required inspection and grading is guilty of a criminal offense, while one who complies with the inspection requirement but misrepresents the grade, thereby defrauding his customer, is not. The only punishment in the latter case is the business injury resulting from the publication of the facts by the department. It seems clear, in the circumstances, that the penalty provided by section 9 of the act should be extended to cover misrepresentation of grades, including the alteration of official certificates. Specific authority also should be given for the publication of the findings of the department relating to false grading.

Under the act as it now stands, appeals respecting the grade of grain can be taken or referred to the Secretary of Agriculture only where the grain involved has entered interstate commerce. This restriction should be removed so that all persons dealing in grain who desire to avail themselves of the provisions of the act may be permitted to do so; and the present requirement that all interested parties other than those joining in an appeal must be named as respondents in the complaint should be omitted. The accurate determination of an appeal depends solely upon a proper examination of the grain, accompanied by tests of correct and representative samples, and such safeguards have been thrown around the collection of samples and the conduct of tests that the right to be heard does not aid in the determination of the true grade in any way.

Food Products Inspection Law.

The food products inspection law at present is limited in its operation to products shipped in interstate commerce. This limitation should be removed. The service authorized by law is wholly permissive and in no way regulatory or mandatory and therefore does not interfere with the rights of any citizen. It tends to facilitate the distribution and marketing of farm products, since it hastens the settlement of disputes as to their quality and condition upon arrival in the market, and any shipper should be permitted to take advantage of it. It would be desirable also to amend the law so that inspections may be made at points that can be conveniently reached from important central markets.

The Warehouse Act.

Section 15 of the warehouse act requires the inspection and grading of grain, flaxseed, or any other "fungible" agricultural product covered by the act. Some grains, particularly corn and flaxseed, are not always stored as fungible products. It is customary, in certain parts of the country, to store grain in bags, or in special compartments or bins, which preserve its identity so that the identical grain may be returned to the owner when it is taken from storage. In many such cases, sampling and grading are entirely unnecessary from the standpoint of the owner. He merely wishes to be assured that the place of storage is suitable, that the warehouseman is reliable, that the warehouse is being operated under the disinterested inspection and supervision of the Federal Government, and that he is further protected against the loss of his property by the warehouseman's bond. Whether he desires to incur the expense of inspection or grading is a matter for him to determine. It seems desirable, in the circumstances, to amend the act so that the grading of grain stored in bags or in special bins or compartments which preserve its identity will not be required unless desired by the depositor. This amendment would not weaken the act in any way, but would merely meet the expressed wishes of producers in certain sections of the country. In short, it would extend to the grain grower the same privilege that the producer of corn, wool, or tobacco already has under its terms.

The Plant Quarantine Act.

The plant quarantine act of August 20, 1912, needs amendment in one important particular. At present, it is difficult for employees of the Federal Horticultural Board, which is responsible for the administration of the law under the direction of the Secretary of Agriculture, to prevent the movement of infected and infested plants and plant products from one State to another when they are carried in private conveyances. The employees of the board, therefore, should be authorized to examine vehicles and other means of transportation not now covered by the terms of the act when there is good reason to suspect that they are being used for the movement of products in violation of the law and the regulations issued under it.

The Lacey Act.

The Lacey Act (secs. 242 and 243 of the Penal Code), which relates to the interstate shipment by common carriers of wild animals or birds, should be amended so as to cover the transportation not only by common carriers but by any means whatever of live as well as dead animals and birds, and so as to require that packages containing game be clearly and plainly marked with a statement of the number and kinds of animals or birds therein. Provision should be made also for the more effective enforcement of the act, and duly designated employees of the department should be authorized to make arrests for violations committed in their presence, to serve warrants issued by the courts, and to seize wild animals and birds which are being illegally transported.

Administration of Wild-Life Reservations.

From time to time, by act of Congress and Executive orders, large tracts of land have been reserved as breeding grounds, ranges, and refuges for wild animals and birds. The administration of these reservations is committed to the Department of Agriculture. Section 84 of the Penal Code forbids hunting on the bird reservations, except in accordance with regulations prescribed by the Secretary of Agriculture. There is no statute, however, making it an offense to trespass on the refuges for wild animals, and no law which authorizes the department to administer the reservations for purposes other than the protection of the birds and animals. Neither is there any authority conferred by law upon the wardens of the reservations to arrest persons trespassing upon them. Authority similar to that contained in the act of June 4, 1897, with reference to the administration of the national forests, should be given the department to regulate the occupancy and use of the reservations, so that they may be devoted to all proper and lawful purposes consistent with the preservation and protection of the birds and animals thereon, and power to properly police them should be vested in the wardens.

Protection of Officers from Violence.

There is now no provision for the punishment of persons who oppose, resist, or assault employees of the Forest Service and the Bureau of Biological Survey in the performance of their duties relating to the administration of the national forests and wild-life reservations and the protection of migratory birds. These employees frequently discharge their duties under hazardous conditions. The lack of any Federal law for their protection is generally known and, in several instances, has encouraged or provoked wholly unwarranted acts of physical violence upon them. Furthermore, the absence of such protection breeds contempt of the authority conferred by law upon the department to enforce the statutes intrusted to it for administration. Section 62 of the Penal Code accords protection to the employees of the Bureau of Animal Industry, and by a simple amendment it may be made applicable to employees of the Forest Service and of the Bureau of Biological Survey.

Authority to Obtain Information.

A number of the statutes administered by the department require the obtaining of information, both for the purpose of properly administering them and of submitting reports to Congress upon which it may base further legislation, but the department can now obtain this information only as the persons possessing it volunteer to give it. Authority should be conferred upon the department to compel the furnishing of such information, under proper safeguards, and to permit its duly designated representatives to administer oaths and to examine witnesses in connection therewith.

New Legislation.

Aside from the revision or amendment of existing statutes, experience has demonstrated the desirability of new legislation along several lines, including the following:

Pure Seeds.

The importation into the United States of forage and like seeds is regulated by the seed importation act of August 24, 1912, but there is now no law to prevent the adulteration or misbranding of seeds shipped from one State to another. While it is not clear that Federal regulation of interstate commerce in seeds would be practicable, it is clear that the enlargement of the department's authority and funds for testing and other investigational work, accompanied by full publicity, would produce valuable results. It has been suggested in the estimates, therefore, that authority be given to determine the purity, viability, and trueness to variety of seeds obtained in the open market and to publish the names of the persons responsible for the shipment or sale of those which are found to be adulterated and misbranded according to the standards established by the department.

Feeds and Fertilizers and Naval Stores.

The need for legislation to insure the purity and wholesomeness of commercial feeds intended for domestic animals and poultry has been apparent for many years. While the food and drugs act is applicable to such feeds, it has been impossible under its provisions to prevent some of the worst forms of adulteration and misbranding. This matter should receive careful consideration, and a comprehensive law which will prevent the shipment in interstate and foreign commerce of worthless, adulterated, or misbranded feeds should be enacted as promptly as possible. In framing the measure, it would be highly desirable to give the department authority to establish standards which will adequately protect the purchaser against articles that have little or no feeding value.

There is need also of similar legislation dealing with the adulteration, debasement, and false labeling of fertilizers and naval stores.

Roads.

Provision should be made, at the next session of the Congress, for the continuance of the highway program along the lines recommended on pages 61 and 62.

Marketing of Live Stock.

Many measures designed to regulate and control establishments engaged in the handling of live stock and in the manufacture and preparation of meat and meat food products have been under public discussion. Several bills dealing with the problems involved are now pending in the Congress and are in various stages of consideration. Undoubtedly, it would be desirable, not only in the interest of the producer but of the consumer as well, to enact legislation which would make it impossible for those dealing in live stock and its products to exercise undue control over marketing facilities or to impose unfair or unreasonable charges for their services.

The Need of New Buildings.

Immediate consideration should be given to improving the housing conditions of the department in Washington. The existing situation makes for waste and inefficiency in many directions. Forty-two buildings or parts of buildings, including both Government owned and rented structures, are now occupied for office, laboratory, storage, and other purposes. They are in widely scattered locations, many of them considerable distances away from the administration building, and several are antiquated, unsuitable, and nonfireproof. The cost of maintenance, upkeep, and operation under such conditions is unavoidably large and will grow year by year.

Recently some branches of the department, at the direction of the Public Buildings Commission, which has full control over the allotment of all space occupied by the Government departments in Washington, have been placed in the temporary frame structures erected during the war. It is difficult to conceive of any type of buildings more inflammable than these. The property and records of the Government in them are exposed to serious fire hazard at all times, to say nothing of possible loss of life in the event of fire. For what length of time it will be necessary to occupy these buildings has not been indicated, but to continue to use them indefinitely is, in my opinion, contrary to the best interests of the department.

No other department of the Government in Washington is as inadequately and unsatisfactorily housed as is the Department of Agriculture, and immediate attention should be given to the development and execution of a building program for it. The first step should be the construction of the long-deferred central building between laboratories A and B along the lines of the original designs, which are still in the files of the department, the acquisition of the land and buildings in one of the squares lying immediately south of the department's reservation, and the erection thereon of a modern fireproof structure of plain though pleasing appearance. This would make it possible to bring the scattered units of the department closer together, to relinquish many buildings which are remotely located, unsuitable for offices and nonfireproof, and to effect a large annual saving in rentals.

The Problem of Personnel.

In any discussion of what the department has done during the year, it must be borne in mind that every item of progress was accomplished under serious difficulties. Rapid advances in the costs of supplies and equipment, materials, and services, and an abnormal turnover in personnel have presented many problems. Increased costs have resulted in the forced curtailment of many lines of work, and the inability to pay adequate compensation has made it impossible to establish and maintain satisfactory personnel standards.

The department is charged with duties that are extremely varied and of the utmost importance. It is conducting fundamental research in every phase of crop and live-stock production and marketing, and it is actively studying the broad economic problems in the field of agriculture. It is supervising the expenditure of the Federal funds which have made possible the inauguration and execution of the greatest road-building program ever undertaken in the history of the world. It is administering the national forests, which comprise within their boundaries 155,000,000 acres of land, and it is enforcing more than 30 regulatory laws, all of them of great importance to the people of the country. It can not hope to maintain these and other activities on a satisfactory basis, or to render the most effective service, without an adequate force of well-trained men and women. And it must not only be prepared to discharge, in full measure, its present responsibilities, but it must look to the future. Some of the most fundamental and difficult problems in agriculture still lie ahead of us, and the planning and execution of experiments and investigations for their solution, as well as the development of the necessary machinery for conducting vigorous campaigns to eliminate the pests and diseases which are handicapping production in every direction and in every section of the country, depend for their success upon the ability of the department to secure and retain the highest type of scientific and administrative officers.

Abnormal Turnover.

The turnover in personnel has reached an alarming stage. Highly trained and experienced specialists and administrators are leaving the service for salaries two, three, and four times as much as the department can pay them, and many of them can not be replaced at anything like the compensation that can be offered under existing limitations. We have a record of the salaries received in outside employment by 528 of the scientific and technical employees who left the department during the fiscal year 1920. This record shows that 383 of these employees are receiving from other public institutions and commercial concerns compensation ranging from $500 to $7,000 more than they were paid by the department.

It is understood, of course, that the Government can not meet commercial competition. The scientific and technical men of the department do not themselves expect it. As a general rule they are willing to accept less in order that they may remain in strictly scientific work, but they certainly should be paid salaries sufficient to keep themselves and their families in reasonable comfort. Otherwise, the department's force will continue to be drained of many of its most efficient workers. It can not be subjected to this steady draft upon its trained personnel without serious impairment of the service, nor can it utilize the funds appropriated by the Congress most effectively with a constantly disintegrating organization and an increasing percentage of new and relatively inexperienced personnel.

Importance of Research.

The department should be in position to retain its scientific and technical workers over long periods. From the standpoint of the public service, a man once embarked upon an important field of investigation should remain there if he is capable and efficient. If he leaves to accept other employment, he carries with him much of the information he has acquired in the progress of his work, information which enriches him in experience, but which can not possibly be put on record. A new man, continuing the work, must, in many instances, go over a considerable part of the field already covered before he reaches the point where his predecessor left off.

We are at a stage of our agricultural progress where fundamental research and investigation are more essential than ever before. We are confronted to-day with serious problems of the most pressing nature about which we know relatively little. No one acquainted with the situation will deny that it would be the part of wisdom to concentrate the best brains of the country on these problems and to provide adequate facilities for carrying on the work in the most comprehensive manner.

Since 1914 there has been no increase in the limitation on the maximum amount that may be paid to scientific and technical workers. It has been impossible, therefore, for the department to adjust their compensation to accord with the great change in economic conditions which has taken place during the past six years. This situation should be corrected without delay, and I have therefore recommended in the estimates to the Congress that the existing limitation be increased to $6,500. I have also recommended that provision be made for increasing the salaries of the chiefs of bureaus and divisions, all of whom have large and difficult tasks to perform and are decidedly underpaid. Their present compensation is considerably less than that received by officers of similar rank in other agricultural institutions and in other branches of the Government service, to say nothing of salaries paid by commercial concerns. I can not too strongly urge that these recommendations be adopted.

The personnel difficulties which the department has experienced are not confined to the scientific and technical workers. They have extended also to the clerical and mechanical employees who, in large part, are carried on statutory rolls, which means that promotions can be made only as vacancies occur. This has resulted in a serious situation. I have suggested in the estimates some changes in the statutory rolls which, while they will not solve the problem, will afford temporary relief until such time as the Congress acts in the matter of reclassification of the salaries of Government employees generally.

Directors of Scientific and Regulatory Work.

With the growth and development of the work of the department along research and regulatory lines, it is highly essential that definite provision be made for the closer coordination of these activities through a central agency. Only in this way can the most effective results be obtained. Every effort also should be made to bring about a further correlation of the research and regulatory activities with those of the appropriate State agencies. The department has no adequate machinery at this time for accomplishing these purposes. I am suggesting in the estimates, therefore, that the Secretary of Agriculture be authorized to appoint a director of scientific work and a director of regulatory work, at $7,500 per annum each, who will devote their attention not only to the development and coordination of the research and regulatory activities of the various branches of the department but will also work out and put into execution plans for their further coordination with similar lines of work in the various States. It is proposed that these directors shall not be subject to removal except for cause. The reason for this is obvious. In an institution such as the Department of Agriculture stability of tenure is absolutely essential if the best results are to be secured.

Funds for 1922.

The estimates of the Department of Agriculture for the fiscal year ending June 30, 1922, aggregate $41,989,384, representing an increase of $10,276,600 over the appropriation for the current year. Of this increase, $950,000 for combating foot-and-mouth disease, $100,000 for fighting and preventing forest fires, and $100,000 for the control of emergency insect infestations, amounting in all to $1,150,000, are merely insurance funds and will be used only in case of necessity. Each and every item in the estimates has been carefully canvassed, and the amount suggested represents the minimum that, in my opinion, should be provided for the maintenance and prosecution of the work of the department. It should be borne in mind, in this connection, that the appropriation for the regular work of the department during the fiscal year 1921 was reduced by $2,186,977, the total amount provided representing a reduction of nearly $6,000,000 below the sum recommended in the estimates for that year.

If the increase proposed is allowed, it will be possible to restore to their former status and to develop properly the important activities which have been discontinued or seriously curtailed because of the lack of funds. It will be possible also for the department to pay better compensation to its earnest and efficient workers—provided, of course, the present limitations on salaries are increased as recommended—and thus to check, in part at least, the abnormal turnover in personnel; and, lastly, the department will be placed in position to attack important agricultural problems which are pressing for solution, to enforce more completely the regulatory laws intrusted to it for administration, and to provide for the more effective administration and protection of our great national forest properties.

Agricultural Agencies Expected to Help.

Our great agricultural industry is in the midst of a difficult and trying period. It is confronted with numerous and complex problems, and the people of the country are rightfully expecting the agricultural agencies of the Nation—the Federal Department of Agriculture, the State agricultural colleges and experiment stations, and the State departments of agriculture—to render increasingly important service in working out ways and means of solving them. These institutions can not hope to measure up to their responsibilities in this respect unless they are properly equipped and are placed in position to secure and retain the services of the best trained men and women in America.

A review of the activities of the department during the past year clearly indicates not only that it will be unable to give proper study and attention to the new and vital matters of national concern now demanding its attention and action, but that it can not even maintain its present standard of service to American agriculture, and through agriculture to the people of the country, without more adequate support. Unless a considerably increased appropriation is granted for the next fiscal year it will be impossible for this great organization to deal effectively with the problems before it, and it will be compelled in many vital projects to mark time. I recognize full well the necessity for economy in governmental expenditures, especially in view of the great financial burdens thrust upon us by the war and the present unsettled conditions; but, in my opinion, it is not true economy to fail to provide the necessary facilities and personnel for this productive branch of the Government, which is returning to the Nation many fold, in terms of wealth created or saved, the expenditures made by it.

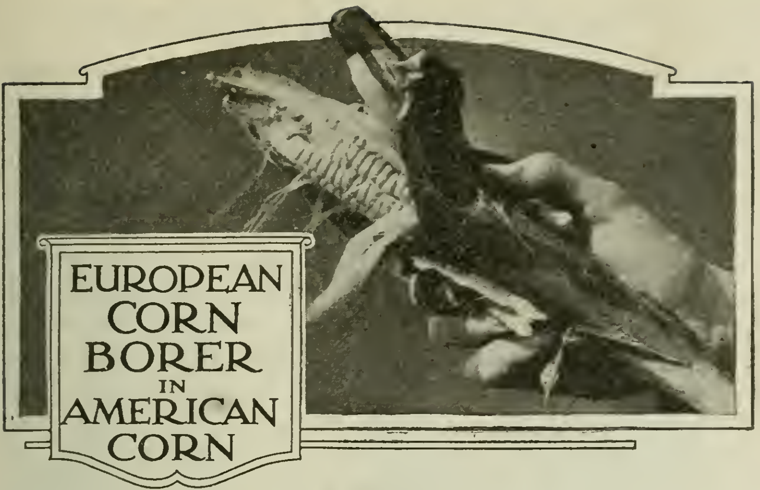
I have already discussed briefly the personnel situation in the department, but I wish to reemphasize it here. Important units are in danger of going to pieces because of the lack of funds to prosecute the work at hand or because present limitations on salaries make it impossible to maintain a sufficient personnel to conduct their operations effectively. This is no exaggeration. In one of the most important bureaus—one dealing with serious economic problems—8 of the 16 divisions are without directing heads because the vacancies could not be filled at the available salaries. One-half of the work of the bureau is now without adequate leadership. A similar situation exists in many other bureaus of the department, and unless it is shortly remedied stagnation will be the inevitable result. Hope of early justice in the matter of salaries and better equipment for work have encouraged many men and women to stay with the department so far, but they can not be held indefinitely if they are to meet with repeated disappointments.

I am confident that no citizen of this country, in private or public life, who has an understanding of the work of the department, of the handicaps under which our present-day agriculture is laboring, and of the national problems involved in maintaining supplies of food and raw materials sufficient for our constantly increasing population, will fail to give his sympathetic support to measures which promise increased strength to the Nation in its most basic industry, the foundation of all other industries—agriculture.

Respectfully,

E. T. Meredith,
Secretary of Agriculture.

The President.



EUROPEAN CORN BORER IN AMERICAN CORN

By W. R. Walton,

Entomologist in Charge, Cereal and Forage Insect Investigations, Bureau of Entomology.

A NEW BROOM makes a clean sweep, but it may serve sometimes to carry a pest into the house. The European corn borer, which sailed into this country like a stowaway, hidden in the heart of broom corn from across the water, has now settled down in America, probably to stay. It extends its infestation over a widely broken belt of territory, from the coast of Massachusetts and New Hampshire on the east through east-central and western New York (fig. 1) to a point beyond St. Thomas in western Ontario, Canada. The total area inhabited by the pest within the United States is about 4,500 square miles, and in Canada it is probably not less than 3,000 square miles.

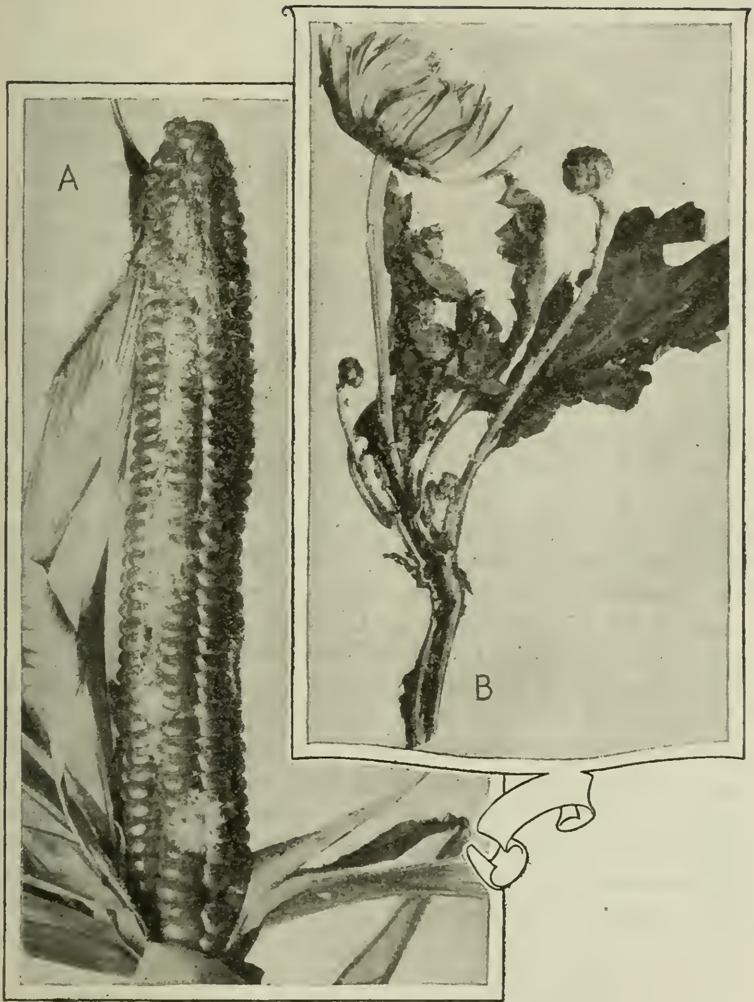
This insect is apparently a native of central Europe or Asia; at least it has long been known as a harmful insect in those portions of the globe. In Italy, Austria, and France it has been considered for many years a serious enemy of the maize or Indian corn plant. Maize seems to be its preferred food plant at present, although, as this plant is of American origin, its native or original host must have been some similar species, probably some one of the larger Asiatic or European grasses or grasslike plants. The insect seems to be able to subsist upon almost all herbaceous plants, and in this country has already been recorded as feeding on no less than 167 kinds of plants, both wild and cultivated. Among the more important of these from an economic standpoint are corn of many varieties, celery, beans, beets, and rhubarb. Corn is the crop that sustains by far the greatest commercial damage (fig. 2), although recently the insect has been found to infest celery in the Boston region so seriously as to prevent its certification for shipment to the most profitable market. This pest also infests such commercially important flowering plants as gladioli, cosmos, hollyhocks,

FIG. 1.—Known distribution of the European corn borer in the United States, on November 1, 1920.

hardy chrysanthemums (fig. 2), and asters, while dahlias are very seriously injured where infestation is unusually heavy and these highly ornamental plants are grown in proximity to corn. A few woody plants, such as elder and raspberry, are occasionally found infested.

Getting Past the Customhouse.

When the corn borer was first discovered in eastern Massachusetts during the summer of 1917, it was supposed that it had entered the country hidden in the stems of raw hemp,



In Corn and Chrysanthemum.

FIG. 2.—*A*, Typical infestation of an ear of flint field corn by the European corn borer; the white, powdery material is a combination of mold and castings of the insect. *B*, Chrysanthemum, with caterpillar of the European corn borer within the stems at lower end.

which is one of its numerous food plants in Europe. A large cordage factory in the center of the area first found to be infested was known to have used hemp imported from countries in which the insect was numerous. This theory subsequently was weakened by the discovery that the hemp underwent a severe process called "retting" before it was exported to this country, which would destroy almost certainly any insect inhabitant of the plant thus treated. The hemp theory soon gave way upon the discovery that broom corn, which is badly infested by the pest in the old country, had been imported and used by factories located near the foci of infestation in both Massachusetts and New York, and customs records were unearthed showing that at least 10,000 tons of such material had entered the United States from infested countries during the period 1909–1914, and that this corn had been widely distributed throughout many States where corn is grown. The supposition that the insect was introduced in this manner received confirmation by the interception, in February, 1920, by Federal inspectors, of two large shipments of broom corn from Italy containing many live specimens of corn-borer caterpillars hidden within the parts of the stalk attached to the brush. Before these shipments were permitted to enter the country they were thoroughly sterilized by the introduction of live steam under cover, after it had been demonstrated that sterilization could not be effected by the ordinary methods of fumigation, except at the expense of incredible labor and extreme cost. In point of fact the European corn borer seems to be a most hardy and tenacious creature, and this doubtless influenced the entomologist who named the group to which it belongs "Pyrausta," a fabulous insect of Grecian mythology.

> "So in the fire, in burning furnace, springs
> The fly Pyrausta with flaming wings;
> Without the fire it dies; in it it joys;
> Living in that which all things else destroys."
>
> —*Du Bartas.*

The reader will wonder perhaps, since the Government maintains a corps of inspectors to examine all importations of such character, why the original infestation was not prevented in a similar manner, but this is easily explained by the fact that this inspection service was not authorized by law until 1913, or several years subsequent to the probable introduction of the pest. It is true, moreover, that, even where an efficient corps of trained inspectors is employed, it is impossible for them to examine every shred of each plant, bale, or bundle so thoroughly as to prevent the entry of at least a few insects. For this reason the Federal Horticultural Board is extending supervision, as rapidly as available funds permit, to the importation of all plants or plant products which are deemed likely to convey insect or other pests dangerous to agriculture from foreign countries into the United States. Most of the insect pests of foreign origin now inhabiting the United States have entered the country through the avenues of commerce, and in view of the great damage inflicted on American agriculture by such introduced insects as the San Jose scale, the gipsy moth, the alfalfa weevil, the pink bollworm, and, last but not least, the Hessian fly, the necessity for some such action seems perfectly obvious.

How can an injurious insect like the corn borer exist in the United States for so long a period as from seven to eight years without detection? The answer to this natural and highly pertinent question is not difficult to find.

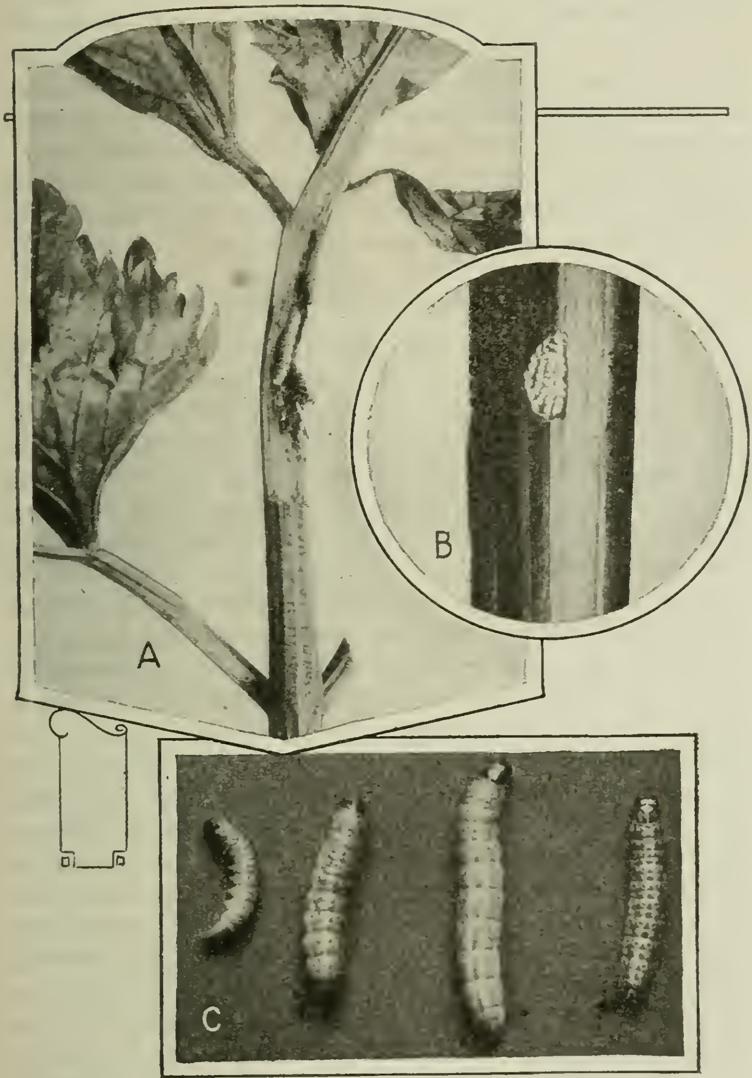
Assuming that several adults of the corn borer, male and female, succeeded in emerging from their hiding places in the stalks of broom corn in a given locality, only a few of these might find their way to growing corn or other plants suitable for the deposition of the eggs. Others might die without the opportunity of mating, while practically all of them would be exposed to innumerable perils from predacious enemies such as birds, predatory insects, etc. Thus in the beginning an exceedingly slight infestation would result. Moreover, it seems to be a well-established habit of the pest to refrain at first from seriously attacking the ears of the corn, and to confine its work chiefly to the tassel and upper portions of the stalk. Then, as it becomes more abundant, it works lower down in the stalks, finally attacking the ears and even entering the rootstocks wherever heavy infestation occurs. Thus it may easily be seen that, as a result of these peculiar habits, the insect might be present in a corn-growing center for a very considerable time without materially reducing the crop or attracting the attention of the farmer, who is not inclined to look for trouble or to complain of an insect pest until it appears in numbers sufficient materially to reduce the yield. Undoubtedly this is just what occurred in the case of the European corn borer. The insect was first discovered in the summer of 1917 by Mr. Stewart Vinal, an entomological investigator who had been assigned by the Massachusetts State Agricultural Experiment Station to aid the market gardeners of the environs of Boston in the suppression of insect pests attacking garden crops. Although gardeners had noticed the caterpillar (fig. 3) in sweet corn for several years, it had not, up to that time, interfered seriously with either the yield or the sale of that toothsome article of produce. Mr. Vinal recognized almost immediately the importance of his discovery, and the State authorities quickly enlisted the aid of the Federal Bureau of Entomology in an investigation of the pest. An account of these activities is given farther on in this article.

An Innocent-Looking Moth.

The adult or parent of the corn borer is a rather pretty and innocent-looking little moth or miller that flits about in the twilight, or early hours of the night (see fig. 4). As a rhymester has put it:

> "Little moth on velvet wing,
> Such an airy, fairy thing;
> How can you so guileless look,
> Yet rob the farmer's pocketbook?"

It is not like many other night-flying moths which are strongly attracted to light, but, on the contrary, is seldom seen except as the insect is flushed from the grass and weeds as one walks through the fields, where it occurs in considerable numbers at certain seasons of the year. The female moth is pale yellow in color, with smoky, irregular lines on its wings, and measures about an inch in expanse, while the male is slightly smaller and is pale smoky brown, with pale yellow spots on both front and hind wings. In eastern Massachusetts this little pest has two generations annually; that is to say, it "breeds" twice each year. The first "hatching" or "brood" of moths lays an average of 386 eggs each, and the second 550, so if we assume that they were equally di-



Caterpillar and Eggs.

FIG. 3.—*A*, Stalk of celery with side cut away to show caterpillar of corn borer within. *B*, Cluster of eggs of European corn borer on blade of corn. *C*, Caterpillars of the European corn borer in three stages of growth.

vided as to sex, and all survived, the progeny or children of one pair of moths would amount to 53,075 insects at the end of one year, while in two years their numbers would amount to no less than 2,816,406,625 worms. Fortunately, however, as in the case of most other insects, many enemies and other restrictive and destructive influences intervene, otherwise we should soon be compelled to give up eating our natural aliments and subsist upon corn-borer caterpillar "en casserole," "a la Maryland," or in some other form for the rest of our lives, or so long as we could stand it.

A Caterpillar With a Prodigious Appetite.

But to proceed with the natural history of the pest: In the moth stage the insect is not in the least injurious, as it takes no solid food, probably sipping the nectar from flowering plants as it flies about on its nefarious trade of depositing eggs where they will do the corn grower the most harm. These eggs (fig. 3) are flat and laid in little groups of from 15 to 20 on the leaves of corn and other plants. They are carefully placed in overlapping rows like the shingles on a building, and hatch in about one week after they are laid. When the little worm emerges from the egg, instead of beginning its career with a hearty meal from the corn plant upon which it was born, it follows the curious habit of many related insects in devouring a goodly portion of the shell of the egg from which it was hatched. No one has seen fit to explain just why these baby caterpillars should begin their diet with a course of eggshell; perhaps this is by way of a relish or appetizer, just as one eats an olive, or as, in historic times, one partook of a cocktail. Or, again, the shell may be of service in sharpening the insect's mandibles in the same way that a favorite young fruit tree too often serves a thomas cat in sharpening his claws. Be that as it may, the caterpillar very soon develops a prodigious appetite for corn, and after beginning to feed it eats and eats, for weeks on end, only stopping long enough to change its clothes when these become too small for it. This insect literally becomes too large for its skin, which it sheds in about the same way as a snake. During this process it takes no food, but devotes all its attention and energies to the business of peeling off its old skin, including even its claws and bristles. This event occurs five times during the existence of the caterpillar. Soon after the fifth molt the insect becomes full grown and, at that time, is about an inch long and one-eighth of an inch thick. The head of the caterpillar (fig. 3) is dark brown or black, while the upper surface of the body or back varies from dark brown to pink. The underside, or belly, of the worm is flesh colored and without markings of any kind. This boring caterpillar bears no distinctive markings by which the ordinary observer might hope to recognize it, and even highly trained experts have at times been temporarily at a loss to distinguish the caterpillar from its nearest relatives inhabiting the same plants. These close relatives are several, but none of them, so far as known, is injurious to agriculture in any appreciable degree. In point of fact, some of them doubtless are beneficial, as they feed on the common weeds.

After about six weeks, when the caterpillar has fed to repletion and is full grown, it becomes stationary, shrinks slightly in length, sheds its skin for the sixth time, and transforms into a light-brown, shuttle-shaped object about three-fourths of an inch long. This is known as the pupa or resting stage of the insect. After the lapse of about two weeks the skin or shell of the pupa splits and the moth emerges. As the adult insect issues from its pupal envelope it is anything but a beautiful object—dull in color and bedraggled in appearance, with its wings crumpled up in little knots above the shoulders. It crawls to some safe perch, however, and in the course of an hour or two has assumed the graceful shape and pleasing colors which distinguish the species. Very soon it is able to mate, lay its eggs, and thus begin all over again the process of development described above.

This life history, or cycle, is repeated twice each year in the vicinity of Boston, Mass., the caterpillar produced by the second brood of moths spending the winter in its burrows within the plants upon which it has fed. Elsewhere in America, however, it is believed to undergo but one generation during the year. Such is the case in both eastern and western New York, although climatic and other conditions there apparently do not differ materially from those prevailing in eastern Massachusetts.

Corn Borer Injury to Various Plants.

Fig. 4.—Top at left: Larvæ and pupæ in cornstalks, and young tassel attacked by the insect. Male and female moths drawn on same scale as the corn. Top center: A female moth with cluster of eggs on a section of corn leaf, on a considerably larger scale. Top right: Mature tassel showing typical injuries by caterpillar (the broken tassel stem is often the most noticeable evidence of the presence of the insect during the early summer months). Center: External and internal views of injuries inflicted on two ears of sweet corn. Lower half of the plate: Snap beans, beets, and celery attacked by the borer, cornstalk containing caterpillars, corn stubbles cut away to show how the caterpillars hide themselves in the fall, winter, and early spring months, "smartweed," which is a favorite food at times, "barnyard grass," which in Massachusetts is often heavily infested, and "cocklebur" plant, a weed that often serves as a breeding place for the pest.

By Rail and Wing.

Although the adult moth flies readily, it is not what might be called a strong flier. Compared, for instance, with the cotton moth, the army worm moths, and other robust members of that family, some of which are known to fly for hundreds of miles, the moth of the corn borer has rather feeble powers of flight. The longest flight that has actually been recorded under experimental conditions is about 3,900 feet. Under favorable conditions, however, the moth might be carried for much longer distances and perhaps for many miles. Investigations during 1920 have made it plainly apparent that this spread by flight, or natural spread, as it is termed, is a comparatively slow process, although it can not be prevented. The means of distribution of the pest most greatly to be feared is its carriage by human agency; that is to say, by its shipment for distances, perhaps, of hundreds or even thousands of miles in crops such as corn, celery, rhubarb, or cut flowers. There is also grave danger of its being included in the material used for packing, such as cornstalks, corn leaves, or husks, and many other dried plants, as hay, for instance, containing large weed stems, etc.; and the quarantine measures which are being enforced by the Bureau of Entomology and the Federal Horticultural Board are aimed at preventing, so far as may be possible, the transportation of such dangerously infested material from the infested regions to portions of the country where the insect is believed not to exist. Especially vigorous efforts are being made to prevent such movement of the pest into the great corn-belt States of the Middle West.

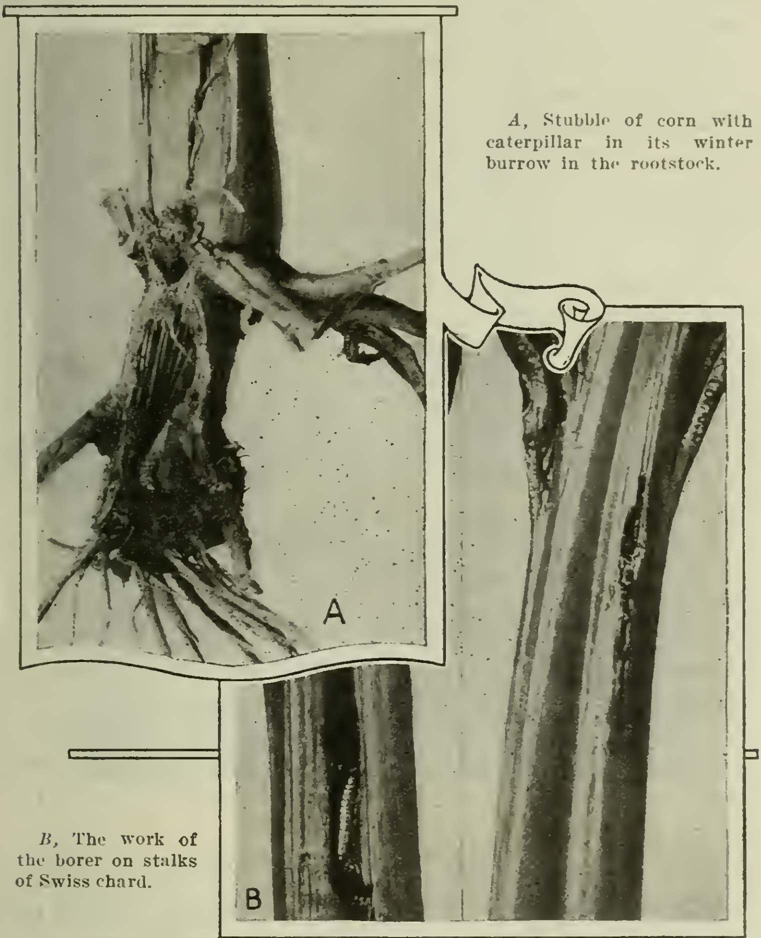
Besides corn, the caterpillars feed also on many other cultivated plants (fig. 4) to a very considerable extent, wherever infestation is heavy. Of the plants thus infested, celery (fig. 3) is perhaps the most important from a commercial standpoint. Many hundreds of acres are planted to this crop in that part of Massachusetts most seriously infested by the insect, and the heavy infestation of this crop may therefore mean a serious loss to the large interests involved. During the summer of 1919 celery was observed to be infested principally in the outer leaves and stems, in which case the insect was easily detected, but at present it has been found to bore directly into the heart of the plant in many instances, and thus render celery one of the most dangerous means of artificial distribution for this pest. This fact has made it necessary for the inspectors to refuse certification, for shipment outside of the infested area, to growers whose crops were found to be most heavily infested. Rhubarb, or pieplant, is another product of the garden which recently has become of importance as a means of spread, but in the case of this plant inspection and certification usually are possible because the stems are separated in preparing the vegetable for market.

These plants are mentioned especially to illustrate how such comparatively unimportant products may harbor and distribute an insect which is of prime importance to a fundamental crop such as Indian corn. It is in relation to corn, of course, that the insect is being most seriously considered by entomologists and others most deeply concerned in controlling or restricting the ravages of the pest. We will show presently that the extermination of this new and injurious pest is beyond the pale of possibility, and the next important question is: How can it be repressed and restricted in order to minimize the damage it can do?

Hard to Kill.

The first thought naturally is: We will poison it. This method has been tried without success, principally because the corn borer feeds within the stalks and ears of the plant, and can not be reached by the poison. Various cultural methods have also been tried without materially beneficial results.

The weak link in the chain of the creature's existence is the fact that it spends the late fall, winter, and early spring months as a caterpillar within the stems, rootstocks, and stubble of the plants upon which it has fed during the previous summer. Thus it seems obvious that if these could be destroyed or so treated as to kill the insects contained therein the desired results would be accomplished. Many caterpillars remain all winter in corn stubble in the fields (fig. 5), either in the stump of the stalk or in the rootstock below the ground, although the majority of them are concealed within the stalks or ears of the corn, even in the cobs. It has been found that the conversion of corn into ensilage destroys all the worms contained therein, and for this reason growers within the infested regions are advised to adopt this method of disposal for their crops. Of course this method does not dispose of the insects remaining in the stubble, and



A, Stubble of corn with caterpillar in its winter burrow in the rootstock.

B, The work of the borer on stalks of Swiss chard.

FIG. 5.—Work of the European corn borer.

for this reason corn stubble in infested territory should be cut at or as close to the surface of the soil as possible in order to remove as many caterpillars as possible from the fields. Where stalks and cobs are not made into ensilage some other effective method of disposal must be adopted if this pest is to be successfully combated, and the only one that can be recommended at present is burning this material during the late winter, early spring, or sooner if the stalks are dry enough not to require excessive amounts of fuel to ignite them. In heavily infested regions the stems of coarse weeds and other plants should be treated in a similar manner.

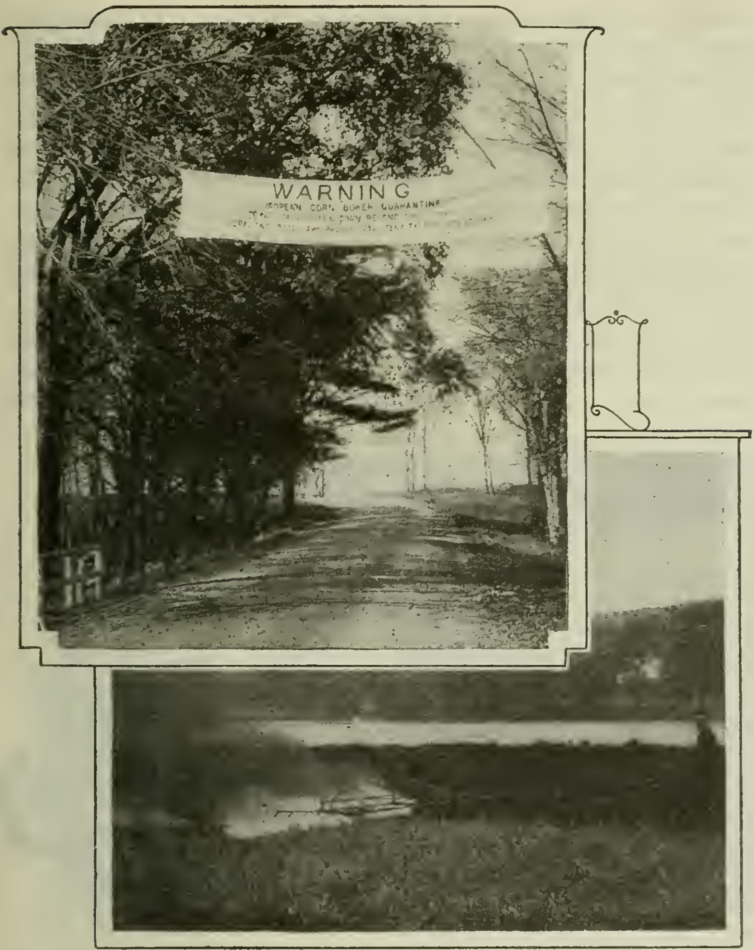
In addition to the methods of artificial control mentioned above, the department is making every effort to introduce from continental Europe the natural enemies of the corn borer. An expert in this line has been in France for more than a year and has established a laboratory there, and large shipments of the insect parasites of the pest already have begun to arrive in this country.

The chief of the Federal Bureau of Entomology has lately been overseas, where he secured the cooperation of several of the most prominent European entomologists in this movement. He reports that although the pest is widely distributed in those portions of Europe where corn is grown in considerable quantities, it evidently is held well in check by its native insect parasites. This augurs well for the enterprise, but, of course, the process of parasite establishment is slow, and several years must elapse before the results of these efforts can be known. The department is engaged, at the present writing, in cleaning up by mechanical means, such as burning and crushing infested material, an area of intense infestation in extreme western New York, in an effort to reduce the likelihood of both natural and artificial spread of the insect to the corn-belt region. For this purpose the special machinery mentioned hereafter is being utilized. (See figs. 6 and 7.)

Government-Control Measures.

Upon the discovery of the pest in the summer of 1917 the Department of Agriculture was called upon to assist in an investigation of the insect in order to obtain information upon which to base efforts at control or possible eradication.

No fund is set aside by Congress to meet emergencies that may arise through the introduction of plant pests, but the Bureau of Entomology responded as well as it was able in the circumstances by establishing, in the spring of 1918, a



Control Measures.

Fig. 6.—Above: Warning banner at the edge of infested territory to prevent automobiles carrying infested plants into uninfested territory. Below: Destroying the corn borer by burning over infested weeds and grasses. Fuel oil is delivered to the nozzles of the burner at a pressure of 400 pounds to the square inch, creating a flame of intense heat directed toward the ground. The machine burns a strip about 15 feet wide.

small field force and laboratory in the center of the infestation at Arlington, Mass. Here, in cooperation with the Massachusetts State Agricultural College, were conducted investigations upon which was based the Farmers' Bulletin (No. 1046) which was issued the following April. At the time that publication was prepared, the area infested was known to be at least 320 square miles in extent and the injuries caused by the insect to sweet corn indicated strongly that it might prove to be a corn pest of real if not of great importance. Realizing that a more thorough investigation should be made, the Secretary of Agriculture requested of Congress in September, 1918, the sum of $25,000 for this purpose. In the meantime entomologists and agriculturists throughout the corn-growing regions of the country had become thoroughly and possibly unduly alarmed over the situation. A committee of State entomologists and other interested persons appeared before Congress requesting, in emphatic terms, an immediate appropriation of at least $500,000

Fig. 7.—Special crushing machine used for treating green plants containing the borer. When infested plants are too green to burn readily they are run through the large corrugated rollers. These apply a pressure of about 40 tons, thus crushing all the insects contained therein.

for the purpose of exterminating the pest. The Sixty-fifth Congress expired without taking final action on either request. The department did not approve the request for the larger appropriation for purposes of extermination because it was convinced that this was impossible. The insect had become firmly established over a territory of several hundred square miles, embracing not only the city of Boston but many of its environs, and had demonstrated its ability to subsist on a great variety of wild and cultivated plants. It was realized that to afford even a fair chance of extermination the expenditure of not thousands but millions of dollars would be necessary, and, as a mere incident to this expense, the reduction of the whole infested region to a desert must ensue. In other words, unlimited funds and unrestricted authority would be necessary as a preliminary to the possible success of such a campaign, which, of course, was absurd. The department further contended that before any very large sums were expended for attempts at extermination, the area of possible infestation should be delimited, at the same time pointing out the fact that no thorough scouting work for this purpose had yet been attempted. The wisdom of this stand was demonstrated in a striking way by the subsequent discovery of several additional extensive areas of long-standing infestation, remote from the original infested territory, which made it obvious that, had the large appropriations been expended for extermination within the areas first discovered, this money would have been largely, although perhaps not wholly, wasted.

Striking a Hard Blow.

The department had recognized from the first the potential danger of the corn borer as a pest to Indian corn, and when in the early part of 1919 a very considerable new area of infestation was discovered in east-central New York, indicating that the pest was much more widespread than had at first been supposed, it acted promptly by requesting the Sixty-sixth Congress to appropriate $500,000 for immediate use in repressive work against the pest. The sum of $250,000 was provided and became available July 24, 1919. With this sum in hand, the first adequate control and regulatory work of the department with this insect was begun. A large force of inspectors and scouts was thrown into the field, rendering fully effective the Federal quarantine which had been in force since August, 1918, and soon making available information upon which was based the subsequent extension of the quarantine regulations. Machinery was designed and built for the purpose of treating the most intensely infested areas with fire, steam, and other agents in order to retard or restrict the natural spread of the pest as much as possible. At the same time the research or experimental work to determine the habits and natural history of the insect was pushed forward as rapidly as circumstances would permit. The newly discovered area of infestation in east-central New York was thoroughly explored and determined to be at least 500 square miles in extent. It is believed to have existed for at least seven or eight years and to have originated from a broom factory located near Schenectady.

The excitement caused by the discovery of the insect in New York culminated in a meeting of the National Association of Commissioners of Agriculture at Albany, N. Y., August 28, 1919. The direct result of this meeting was a resolution urging Congress to appropriate $2,000,000 to carry on a combat with the corn borer. Believing that this demand largely exceeded the immediate needs of the work in hand, the department recommended an appropriation of $500,000 and Congress responded by providing the sum of $400,000, to be immediately available, and the present activities are being conducted with this money. Most of this is being expended in scouting operations and the enforcement of the quarantine regulations in the five States of the Union where the insect is known to occur. This work is a task of greater magnitude than is realized by the general public, involving as it does the employment of 200 or more inspectors during a large part of the year, distributed throughout most of the northern States. Some idea of the work involved may be conveyed when we say that more than 18,000 certificates of inspection were prepared and issued in a single day recently in the Boston area alone.

What It Means to the Corn Grower.

After reading all that has been said thus far, the corn grower may remark to himself: "This is all very well" (and if he is good-natured he may add "and interesting"), "but just what is this bug going to do to my corn? What is it going to cost?" Very good; let's look this incubus straight between the eyes.

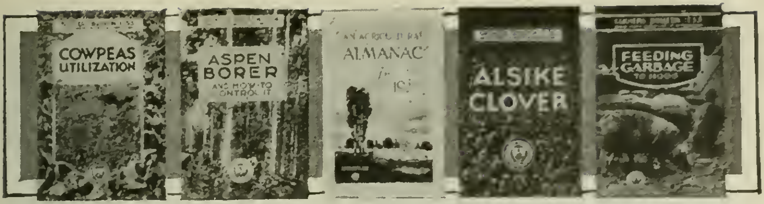
In a field-corn growing region where the insect has almost certainly been present for approximately 10 years it occasions a direct loss of about 2½ per cent of the kernels of all the ears. There is in addition to this an indefinite amount of indirect loss due to defective nutrition of the ears caused by the boring of the worms in the stalks as well as by breakage of the stalks, but none of these injuries has been serious enough to prevent the production of an excellent crop of corn in any field examined. This statement applies only to a region where the pest breeds but once a year, but it seems likely that the insect would have two breeding periods, or generations, throughout the southern half of the corn belt in the United States. To allow for this difference, suppose we more than double our estimate of the possible loss and assume that it might reach 7 per cent of the grain in two-thirds of the crop. That would mean an enormous loss in money with a crop such as was produced in 1920 of more than 3,000,000,000 bushels. At a possible market price of 85 cents per bushel this loss would reach the enormous figure of $119,000,000.

But wait just a minute; we have disregarded entirely for the moment the fact that the losses upon which our estimates were based have occurred in a region where the pest has been *permitted to multiply unrestrained for a period of 10 years.* This can not happen in the corn-belt States, now that we know the habits of the corn borer, and for this reason the losses which it could inflict undoubtedly would be greatly reduced by the methods of combat already described. In view of these considerations, it certainly does not appear that the pest would be able, in any case, to destroy the crop of any progressive farmer.

No Decisive Victory for the Pest.

At least one man of science has gone into public print with the statement that if the pest is not eradicated " the corn industry, together with everything that depends on it, is doomed in North America," etc. This gloomy statement must be regarded as pure hyperbole, and in case the reader has been frightened by this or similar visions, let the following thought strengthen his wavering soul. *No introduced insect pest ever has destroyed any important agricultural industry in America.* The San Jose scale caused great losses to the deciduous fruit industry for many years, but it has been largely instrumental in the production of better fruit and in securing better prices for that fruit. The Mexican cotton boll weevil has done great damage to the cotton crop of this country for a very considerable period, but cotton is still a major crop in the infested regions, and at least one community has erected a monument to the boll weevil as a benefactor, in forcing diversified farming upon a region that was sorely in need of this innovation. The Hessian fly, which came here late in the eighteenth century, is the worst insect pest with which our wheat growers have to contend, taking a toll of 10 per cent of the crop, but it has not prevented us from becoming one of the two greatest wheat-producing nations on the globe, and no pesky caterpillar from overseas is going to be permitted to deal a knock-out blow to that greatest of all American agricultural institutions, the corn crop—"*not so you can notice it!*" But, as with the older pests, so with this new one, we shall be compelled to fight long and hard.

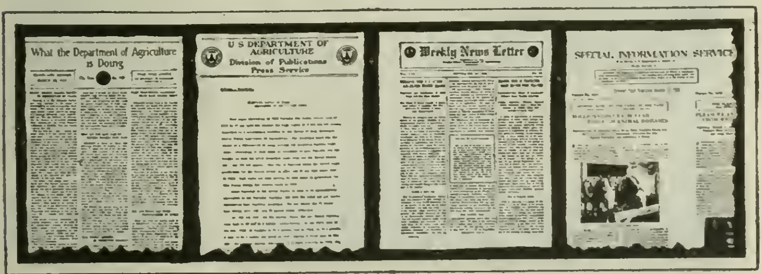
The Male Moth.



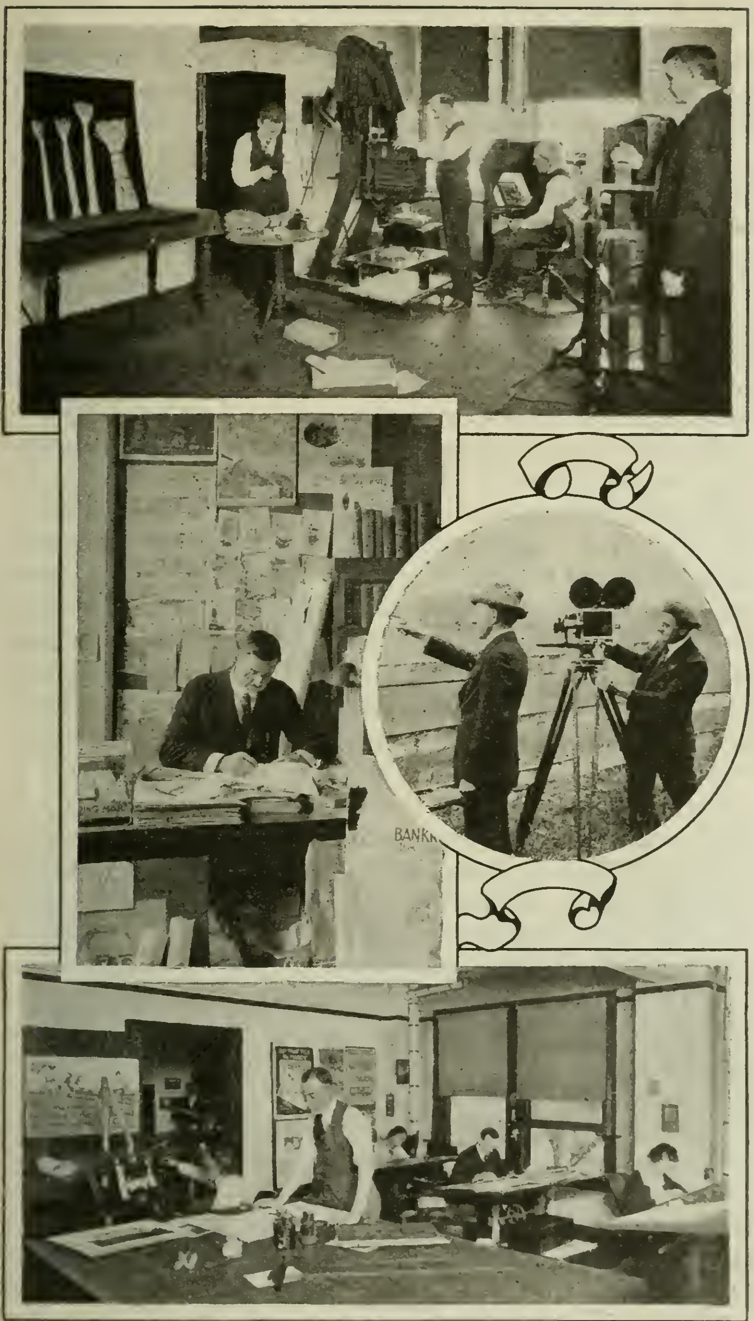
SCIENCE SEEKS THE FARMER

By L. C. Everard,
Chief Editor, Division of Publications.

SOMETHING IS WANTING TO SCIENCE UNTIL IT HAS BEEN HUMANIZED, said Emerson. That was long ago, before the development of the Department of Agriculture. Were he here to-day he would probably say that something is wanting to agricultural science until it puts on its overalls and gets out between the plow handles. And the scientists of the department would agree with him; for though they may in their laboratories surround their work with a cloud of hard words and harder ideas like a smoke screen around a battleship, they realize that their investigations and discoveries are made for the sake of mankind, and acquire their chief value when the veil of technicality is torn away. Cyclonic action means something to the farmer when translated into terms of rain or snow or fair weather. And scientific study of the life history of *Ascaris lumbricoides* (see page 175) becomes a blessing to him when a way has been found to apply the knowledge so as to save his pigs.



Exhibits, Publications, Demonstrations on the Farm and in the Home.



Bulletins, Photographs, Drawings, Movies.

Agricultural science begins really to function only when it reaches the farm. And in America it reaches every farm whose gate is not closed against it. The results of thousands of great scientific researches and of thousands of studies in the practical application of these results to farming can be had for the asking. Farmers' Bulletins, easy to read and at the same time reliable and accurate, give the answer to all kinds of puzzling questions, not only about field and orchard, poultry and live stock, marketing of produce, and many another angle of the farm business, but about making the farm home a pleasanter place to live in and the children more robust and healthy and contented.

Many of the department specialists are not only scientists; they are also farmers. They know what the farmer is up against, and when a new method of doing a thing is found or an old method is improved they can tell him how to make it work. They are constantly seeking ways to fit new discoveries and developments into standard farming practice. And working alongside them, to put the information in the most convenient form, are the experts in writing, printing, pictures, and exhibits of the Division of Publications. A great fund of farm facts locked up in the files in Washington would not be of much help. They must be got into the field to produce results, and to get them there the facts are put up in various kinds of packages—bulletins, press stories, pictures, posters, models, and movies—whatever will most economically and at the same time most effectively carry the scientific studies of the department to the farmer and enable him to convert them into farm practice.

The department is constantly working to find out what the farmer's everyday problems are and constantly seeking ways to reach him with the answer. It is not unusual now for him to find a home-demonstration agent in his kitchen or meet the county agent at his gate. These are salesmen of science and the wares they have to offer are the combined knowledge and experience of the army of scientists and practical agriculturists of the State colleges and the department. And their terms are easy, for service is what they sell, and all the farmer has to pay is the time he takes to learn what the service is. Through them the other methods of distributing farming facts are made more effective. Many ways are found of getting all kinds of helpful information to the farmer. When he goes to town he may find a movie scheduled in the schoolhouse, showing just how to dust his cotton, or dip his cattle, or build his poultry pens. If he attends a meeting at the town hall he may see a department poster telling of some important discovery in farm practice or warning him of some danger to his crops from insects or disease and telling how to meet it. At the State fair he may find under the big sign "Department of Agriculture Exhibit" samples and models of crops and devices he never saw before and may see actual demonstrations that will help him with his own farm work. Even when he reads his county paper or his farm journal the department is with him, for from its press service goes out to all the farm press of the country news of the latest doings in agricultural science and advancement. Agricultural science not only seeks the farmer but it finds him. And the farmer is becoming more and more expert in using this scientific knowledge when it gets to him. The reward is not his alone; the Nation reaps a harvest in more meat from farms and ranges, more crops from the fields, and better all-round development of its agricultural resources.

Prints of the Department of Agriculture

Farmers' Bulletins

More than 500 primers, each containing practical suggestions and information about some activity connected with the farm or home.

Department Bulletins

Bulletins containing new information obtained by the scientific staff through research and investigation.

Circulars

Leaflets issued to meet some emergency or to publish particular information needed immediately by industry or agriculture.

Soil Surveys

Descriptions of the soils of the country, by counties or other selected areas, based on careful, scientific surveys and accompanied by large detailed soil maps in color.

Journal of Agricultural Research

A semimonthly scientific journal which furnishes a point of contact between the investigative staff of the department and scientists all over the world.

Experiment Station Record

Abstracts of new publications on agriculture and related subjects, published monthly.

Weekly News Letter

News of the latest developments in agricultural work and in the aims and policies of the Department of Agriculure.

Market Reporter

A weekly report on market quotations, supplies, and movement of farm products.

Monthly Crop Reporter

Official estimates of crop conditions and crop yields.

Weather Reports

Many series of reports on weather conditions, the Monthly Weather Review, climatology, snow and ice bulletins, climate and crop bulletins.

Public Roads

Information, chiefly technical, on the principles of road construction and the development of road building, published monthly.

Service and Regulatory Announcements

Notices of decisions and other official information regarding the various laws administered by the department.

Yearbook

A report of the operations of the department, articles on agricultural subjects, and complete tables of agricultural statistics.

By O. B. Martin, *Assistant in Charge Demonstration Club Work, and* Ola Powell, *Assistant in Home Demonstration Work, Office of Extension Work in the South, States Relations Service.*

SUCCESSFUL demonstration work begins at home. It develops from there.

Home demonstration work began in 1910 with 47 girls growing one plant—the tomato—in their home gardens. They learned more about plant life than they could have done by starting with a dozen vegetables. By the time 50,000 girls grew tomatoes in their tenth-acre gardens, their families and neighbors had absorbed more information about vegetables than they had ever acquired before. Some knowledge, skill, and initiative are available in every community, and there is always need to extend good practices already in use. Suggestions and direction stir them to activity, and the results are cumulative and far-reaching. The same educational process followed canning of the product. Naturally the mothers had an interest in their daughters' training and took a hand.

A decade of achievement by girls and women on the farmstead furnishes a perspective most valuable. From the one vegetable they have gone through the garden, orchard, poultry yard, barnyard, kitchen, house, and household to the front lawn. The first home demonstration agents were told that it was their mission "to develop the resources, increase the harvests, improve the landscapes, brighten the homes, and flood the people with knowledge about helpful things."

There were many simple processes to be gradually worked out before coming to the last objective. The deluge of knowledge would have been disastrous out of season.

The growing of tomatoes caused requests to come from the people themselves for help in growing a variety of other vegetables. Second-year girls wanted to extend their activities and their knowledge, so they put part of their plats in peppers, okra, sweet corn, or other crop suitable in combinations with tomatoes. Third-year and fourth-year club members went farther along the same lines, and also tried out new crops like New Zealand spinach, chayotes, and dasheens, until the perennial garden idea was developed wherein long-lived vegetables, berries, and small fruits were grown. Interest in the perennial garden serves as a magnet to draw the girl back to the old home. It also furnishes an incentive for her family to maintain a living memorial to her while she is away at high school or college. The fruits of her plantings are harvested and enjoyed between school sessions and a quantity preserved for sale or home use during the winter months.

While the home demonstration agents had a simple method of approach, and while they had the workers take one step at a time, the larger purposes were kept continually in mind. It was their early and persistent aim to place country life upon "a higher plane of profit, comfort, culture, influence, and power." These practical pioneers realized that there is a proper order of procedure. The steps to this evolution can not be interchanged. Comfort and culture must follow, not precede, profit. Earning comes first. After the first step is taken the others come easier.

Learning by Doing.

Those who followed the approved plan of work made signal successes; those who, from preconceived notions, tried to spread much miscellaneous knowledge first, failed. In other words, the agents who started with the idea of getting girls and women to make simple, profitable object lessons, and then guided them on in constantly advancing stages, have established a new field of service which opens and unfolds in its possibilities for good. One of the Virginia women agents, at the close of her first year's work, in 1913, saw the point and gave an excellent definition when she said in a weekly field report:

> After all, this canning-club work means that we are to get a girl to do something worth while, have it approved by those she loves, and then lead on to greater things.

The club girls did the first utilization work so well that many thought that canning was their only interest and purpose. It became a national object lesson. They adopted a brand and label based upon the club emblem. Their motto is, "To make the best better," and the four H's on their badge stand for the improvement of the head, hand, heart, and health. The 4–H brand, therefore, must have real significance because it calls for increasing purpose and excellence based upon determination and perseverance. Plain tomatoes were canned so well that the most expert judges pronounced them equal or superior to the best commercial brands. In many counties canned tomatoes were sold in carload lots, and the output was of considerable value. But the object was not to compete with the canning factories; the development went farther. The tomato had other market and pantry possibilities, so soups, ketchups, pastes, and other delicious products were canned and bottled. Then, as other vegetables were planted and studied one by one, the same standard was applied in their manufacture and conservation.

Here it is worth while to comment that these girls demonstrated to thousands that much work previously done in the cities should be done on the farms, as a matter of conservation of human resources and a contribution to the maintenance of balance between rural and urban civilizations, in this way keeping some of the manufacturing and business profits in the country and giving farmers and their families more to engage their minds and hands than the simple production of raw material. This means an increase in farm profits in the farm homes.

Dr. Seaman A. Knapp, the founder of the demonstration work, told those most interested at the beginning that the club members "could make a garden and raise the fruits and poultry to support the family if they would." He said:

> It might brown their skins and soil their hands, but it would help them to do something and to know something. It would aid the family pocketbook and help the family

> character. There is no sufficient reason why every American family should not own a good home and have a snug sum laid by for a rainy day, except laziness, lack of thrift, or possible sickness, and nine-tenths of all sickness is due to malnutrition, which is another name for ignorance.

To trace the accompanying results of the constantly growing and enlarging activities of home demonstration history is to follow events romantic in their attractiveness and vital in their educational power and value. The girls were not given pedagogic lessons on sanitation, health, and nutrition, but scrupulous cleanliness was required in carrying on club work. In thousands of cases the jars and cans of wholesome fruits and vegetables in the pantries drove the patent medicines from the shelves and the pill boxes from the mantels. It is no reflection on science to say that the girls learned and taught more nutrition than is possible from academic lessons on calories, enzymes, and vitamines. It is true that they learn these things afterwards, for they develop desires for knowledge and motives for service. Every girl who makes a food demonstration is a center of influence and a potent teacher, on the general principle that one example is better than a thousand arguments. Every demonstrator is also a health and sanitation officer for her State and Nation.

There is something appropriate for physical, mental, and spiritual development in the cultivation, utilization, and study of plants and animals by growing boys and girls. Nature's fundamental lessons can best be learned in youth. The club member learns by doing and grows by achievement. The child bristles with interrogation points, and most of them ask about the wonders of nature. How sad is the picture when the eye is not trained to see, the hand to form, and the mind to know the living resources so abundantly furnished everywhere!

Doing It Well.

After three or four years' work with a few vegetables, additional suggestion or instruction was not required to get a great campaign of demonstrations started to save surplus fruits and other vegetables. It simply came forth from every quarter. People usually enjoy the doing of things they have learned to do well.

The girls had learned to put up vegetables in the most attractive standard packs, both singly and in combinations. They had commenced to grow additional vegetables and introduce new ones for their standard mixtures. Many of them grew pimiento peppers. The club members in one county alone sold several thousand dollars worth of fresh peppers, seed, and canned pepper products in a year. Such demonstrations furnish the best medium for the introduction of new crops. This pepper, which helped to make Spain famous for salads, has come into the diet in some

To Save Labor in the Home.

sections far more rapidly than the tomato did when it was a newcomer there. Additional zest was added to packing other vegetables and also to the preparation of them for serving, because it was found that these peppers were so suitable for use in garnishing various attractive products. The beautiful exhibits of relishes and chutneys, as well as the highly colored packs of the pimientos themselves, increased their popularity rapidly.

In the fruit work, also, the important thing was the establishment of a high standard. When a beautiful economic pack of peaches won $10 at a fair and was carried around by the agent in her instruction work, it was copied as a work of art. Then there was emulation and rivalry in making similar packs of berries, cherries, pears, figs, guavas, and all other fruits of the orchard and vineyard. The girls and their mothers realized as few people do that skillful and artistic standardization of product, container, and label goes a long way toward solving the problems of marketing.

Second-year and third-year club girls showed the effects of training when they came to convert the fruits into jellies, jams, marmalades, conserves, fruit macedoines, juices, and preserves. Such an array of color and sweetness had not been seen in their homes and communities before. They searched the bulletins and books for further information about hydrometers, pectin, and microorganisms. They hunted in the gardens and the forests for plants and leaves suitable for flavor and seasoning. They were part of a moving force which expands and develops as it goes. Thoroughness in handling a single fruit is well illustrated in the making of jelly, marmalade, butter, paste, and juice from the muscadine grape. Every product must come up to the standard before it is entitled to the brand label. Thus the different fruits are reduced to a common denominator and it is "the best."

Instruction on the Side.

At this stage of club progress, opportunities for incidental and supplementary instruction, instruction on the side so to speak, were seized upon by the agents. Cleanliness and sanitation are mandatory; so the kitchen was often cleaned up and the house screened, with homemade flytraps at the door, in order that the output might be high class. Sometimes running water was provided to facilitate the work in hand. This is a better line of approach for getting results even in home sanitation than the lecture method. These club members have motives which impel. They wish to excel for their own sakes. They improve their equipment because of a need that is realized. It is one thing to give a class of girls a lesson in sewing. It is a different thing to have a club meeting cut out and make a club cap, apron, or uniform. This much sewing by girls leads to the making of pennants, emblems, banners, hats, and clothing. New interest is aroused in dressmaking and millinery among the women.

The agent who helps a few women make fireless cookers and then has them come to the club and demonstrate the best methods of cooking several vegetables out of their daughters' gardens, or out of the supply which they have canned, stored, dried, or brined, soon has many other women and girls wanting to do the same thing. A South Carolina agent outlined the demonstration method when she wrote in her field report somewhat as follows:

> I have done nothing for the past three weeks except direct and coach 87 girls in the making of Dixie Relish. I notice, however, that hundreds of women are making it, too. The editor of the county paper wrote a column in his paper about it. Indeed the whole atmosphere seems to be filled with the aroma of Dixie Relish.

A simple recipe was sent out from headquarters, and that was the way it was used in hundreds of counties. This kind of campaign gets somewhere. However much people may dislike joining in drives that include lecturing, urging, and scolding, they do not object to propaganda based upon the accomplishments of the members of their own families.

About the time when adult women on the farms began to demand a definite part in the home demonstration work it was noticed that there was more of a tendency toward stability and permanence in the girls' clubs. The active partnership of the mothers anchored the activities and the incidental results more and more in the homes. The canning created a revolution in the manufacture of canners, cans, jars, and labor-saving appliances. The mothers used the equipment in their daily tasks in the kitchen, when it was not being used in canning. Steam-pressure canners became pressure cookers. Inventive minds began to give thought to kitchen utensils and conveniences for saving time and labor there. This means reformation in kitchens. Pantries became places to which mothers could point with pride. This development in itself called for constant improvement in arrangement, equipment, and efficiency.

Mothers and Daughters Get Together.

As the home is the fundamental unit of all organized society, so home enterprise comes before community activities. It is a mistake to try to organize the community without fundamental preparation among its members. Women who have backed up the girls' clubs and demanded aid in their own demonstration activities are the best material for organized club work in both large and small groups. They cooperate readily. They have something to tell. They are anxious to learn. Their interest in club meetings is keen when profitable, progressive, and useful object lessons put on by themselves and their neighbors are under consideration.

The supervisory forces in different places reported simultaneously that club girls were ready to take up poultry. By a similar coincidence adult women, after some egg-grading

A Poultry Club at Work.

practice, formed egg circles in counties widely removed from each other, but where excellent advanced work had been done by the girls and the home demonstration agents. The partnership of the mothers then became close and vital. The club girl wanted standardbred chickens so that she might win some of the generous prizes offered by public-spirited business men. The mothers wanted the same kind of poultry, so that the eggs might be uniform with those brought by other members of the egg circle. It meant more money for all of them. In many counties, mongrel chickens have been eliminated by this cooperative effort.

This was not all. The girls furnished vegetables, the women the chicken, and Creole Chicken was demonstrated as many times as Dixie Relish had been. Large numbers of culled hens and surplus roosters were canned for future use.

Meat for Dinner.

The most significant outgrowth of this use of poultry was a demand for the conservation of other meats. Clubs of women asked agents to demonstrate the canning of beef, pork, mutton, fish, and game. Out on the plains they canned jack rabbits and "bunny sausage" and put the 4-H brand upon them. By this time the county home demonstration agent began to realize that she was the public dietitian and that her qualifications must constantly improve. She was asked about the proper combinations of various vegetables, fruits, and meats.

Working with meat has fostered the club idea. Groups of women have come together to help a neighbor can whole steers or hogs. They want expert demonstration in cutting up the carcasses properly. They soon find a need for recipes for using or saving the by-products. Then the home demonstration agent is ready with definite plans for making roasts, sausage, meat loaf, liver paste, headcheese, scrapple, and soups.

Individual demonstrators who have attained excellence in preparing meat products systematically market them under their own farm names. They have their own labels printed and proceed to build up reputations and trade accordingly.

Several hundred demonstration agents and clubs where the climatic conditions are favorable have put the home curing of meat into their programs. Much good instruction has been given in cooking cured hams, from one to three years old, according to certain fine old Colonial methods, and yet nobody says it was a cooking school or class. A member occasionally invites the others in her club to come to her home. She and her daughter want to impress the visiting members with their skill and efficiency. They serve a well-cooked cured ham with all proper accessories of vegetables, fruits, and home-made bread and butter, seasonings, and garnishes. Who is able to define or measure the amount of helpful knowledge imparted or exchanged upon such an occasion?

Help from Specialists.

As the various phases of this work grew, and as the numbers of people in it increased, it was found that the supervisory force could not keep pace with the demands for tests and experiments, and also with the advance of science applicable to all the products which were being utilized. Hence specialists were called upon for assistance, not only in meat work, but also in horticulture, poultry raising, beekeeping, and other lines in which the girls and women have an ever-increasing interest. Specialists in home science are not so numerous as they are in farm science; but then Congress passed appropriations for the establishment of agricultural colleges nearly 50 years before the cooperative agricultural extension act came into existence.

Better Bread.

The extension forces specially charged with home activities took advantage of the conditions and needs incident to war times to give nation-wide object lessons in the making of better breads. Light and quick breads were made in thousands of homes and club meetings. Modifications were made, because corn, rice, rye, potato, and other materials were substituted for wheat in bread making. Contests for the honor of making the best bread in the club, or in the county, were held in all parts of the country. The winning club members worked for weeks in their home baking, to be able to display a perfect product. Fifteen-year-old girls who were not accustomed to giving much help in the kitchen took burdens off their mothers and gained valuable skill and knowledge in these operations. Public bread-judging contests, at which the club members and demonstrators not only judged the breads but gave talks on how they made them, were an important part of this far-reaching campaign. More and better work was done with pastries, pies, puddings, cake, and other articles of food in which flour and meal were important ingredients.

The home demonstration agents in this campaign, as well as in all similar ones, took advantage of the interest aroused to promote the making and use of time and labor saving devices and utensils, such as kitchen cabinets, bread mixers, measuring cups, standard pans, better ovens, and other conveniences which have a tendency to introduce system and efficiency into the work of the kitchen. These things have been built or bought by thousands of club members in order that the bread work might be well and thoroughly done.

Milk.

No more difficult task has been undertaken in extension work than the handling of milk and its products. Making butter by proper dairy methods, in most homes, requires great care and attention. The agents who have really reformed butter making in their counties have carefully selected a few demonstrators and patiently helped them individually until success was assured. Afterwards these women and girls became the examples and inspiration of the others. Each one became a nucleus for the extension of this work in her community. The demonstrations were more often conducted in the homes. Successful butter makers found better butter profitable, and this item appears conspicuously in many reports of increased incomes from the enterprises of the farm homes. The making of cottage cheese frequently followed the butter work.

In some communities, the interest aroused along these lines resulted in the sale of milk and cream, and in all sections the use of milk in the diet increased. Campaigns for more family cows have been waged in many counties, and agents have reported, as a result of their work, thousands of family cows on farms where there were no cows before. The slogan is, "Keep the home cow milking." Propaganda has been promoted for more milk in the family diet, and the mothers follow the advice of the home demonstration agents because they have confidence in them as a result of what has been accomplished in previous work.

Educational milk exhibits at community, county, and State fairs have aided greatly in milk campaigns. It is more logical to approach the question of child feeding through milk demonstrations than it is to lecture mothers on infant feeding. The whole plan of the demonstration work has been evolved upon the theory that the people are to utilize the material resources about them in making impressive and instructive examples for their neighbors. It is just as wrong for an agent to go to a mother and tell her that she has come to teach her how to feed her baby as it is to tell her that she has come to teach her how to cook. The agents have saved the lives and improved the health of the babies without using crude and untactful methods of approach.

During the influenza epidemic, the public often looked to the home demonstration agent to organize the forces and conduct the relief activities, because of her ability to prescribe proper diet and distribute it to afflicted ones everywhere. The agents did not take the places of the doctors or nurses, but they made the efforts of these public servants much more effective.

Home Conveniences.

At every step taken in this system of education it has been noticed that the workers appreciate the use of better devices and facilities for their work. Fathers and brothers also take the greatest interest in making such equipment whenever they have enough mechanical skill. Talent of this kind has been improved by use. The making of home conveniences has become a feature in the program. The girls and women themselves have learned to use hammers, saws, squares, and chisels. This is no small achievement in itself. Thousands of fireless cookers, iceless refrigerators, kitchen cabinets, tables, wheel trays, ironing boards, woodboxes, butter molds, shower baths, and other useful things have been made.

Let it not be inferred that the making of such things at home has prevented the purchase of the best available equipment. It has had the opposite effect. In many cases it has shown the need and created the desire for more useful and better things. Having made a profit out of their energy and thrift, they were anxious to use some of their earnings for comfort. The installation of home waterworks comes more easily when the need of running water is felt in connection with profitable canning, or butter making, than it does where the farmer is importuned to pay all the expenses of it from his crop or live-stock returns. Electric outfits for light and power are introduced more rapidly where churns, washing machines, meat grinders, fruit-juice mills, and sewing machines can be attached and made to pay big dividends in the saving as well as the making of money.

The profit feature may reveal itself in thrift and economy. By and by it will be more fully realized that such things reduce drudgery and increase the opportunities for intellectual activity on the part of the farm family.

Better Homes.

The foregoing program of work having brought the women agents into the homes, their help is now being sought in home arrangement, equipment, construction, and beautification. In the tenth year of the history of home demonstration work practically every county home demonstration agent reported that home improvement is one of the things in which her club members are most interested and in which they are seeking help. This work divides naturally into two parts: First, that which has to do with the house itself, such as remodeling, building, and equipping with labor-saving conveniences and suitable furnishings; and, second, that which deals with plantings in the surrounding grounds and the general improvement of the farmstead.

Members of girls' clubs have become interested in refurnishing their own rooms, refinishing or even making the furniture needed. Impetus has been given by exhibits of such work at county and State fairs. State fairs have included club girls' rooms as a part of the home demonstration exhibits. Women demonstrators are constantly asking for help in the rearrangement of kitchens and in the purchase of new furnishings for the home. Much work has been done also in renewing old furniture and in refinishing floors and brightening walls. The sewing done by the members of the girls' clubs revived interest in making rugs, baskets, curtains, spreads, luncheon sets, and table runners. It paved the way also for many "clothes clinics" where the women made over old clothing, and this promoted thrift and industry. Home millinery became the vogue, and much money was saved and great skill developed in making hats. Community meetings are held at which the results of their work are displayed, and suitable garments for each member of the family are shown on living models.

Many demonstrators who felt that it was not possible to make many noticeable changes in the house itself, have nevertheless been interested in planting trees and shrubs for the beautification of the ground surrounding the house. In every case the use of native material was encouraged, keeping in mind a succession of flowers and beautiful foliage. Nurserymen cooperated by offering plantings as prizes or as part of special club offers of orchard stock. Such work can not help but make great changes in the beauty of the farm homes during the next few years.

The average home demonstration agent can look over a kitchen and replan its arrangement so as to save steps; she can survey a site and suggest a suitable house. The time has arrived when she must become a landscape artist. Many agents can already lay out a farmstead and make it symmetrical and beautiful. Any of them is able to change a front yard into a lawn. The goal that lies ahead is a condition such as the founder of the demonstration work described when he said:

> The farm must be a place of beauty, so attractive that every passing stranger inquires, "Who lives in that lovely home?" The house is of minor consideration—the gorgeous setting of trees and shrubbery holds the eye.

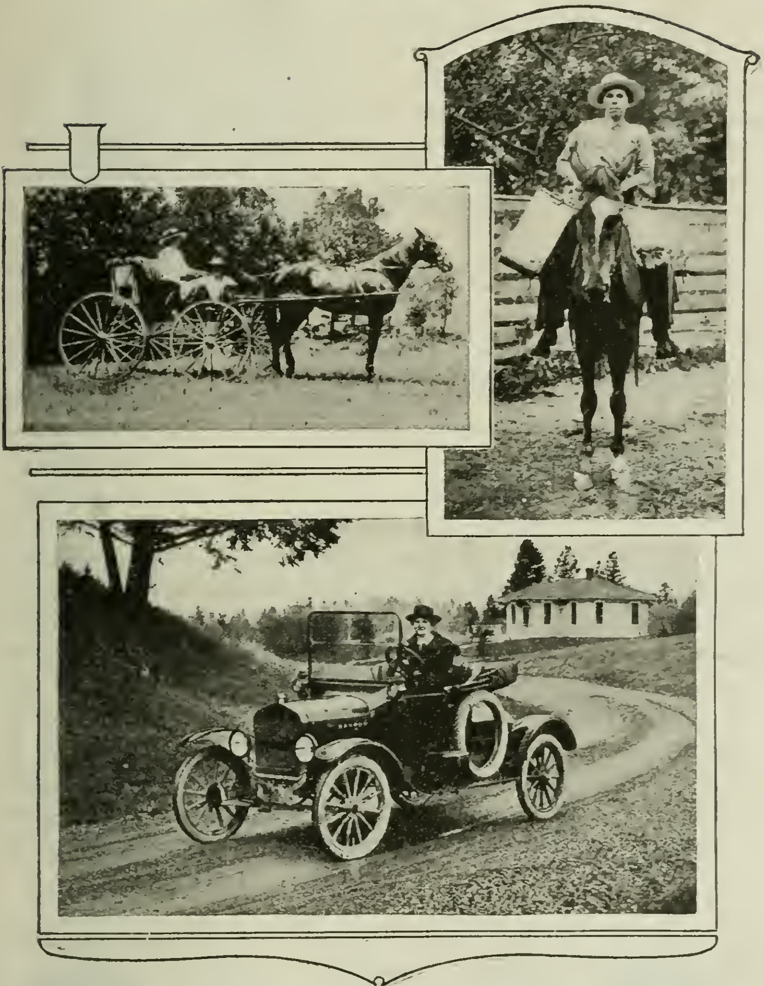
He longed for such a condition, because he said:

> It is also realized that the great force that readjusts the world originates in the home. Home conditions will ultimately mold the man's life.

Thus these readjustment forces commenced at the bottom and marched ever onward and upward. A decade has developed a cycle, but the work is still only well begun. Recruits come in every year and begin with the rudiments. Experienced ones take advanced steps in every direction, while those just starting have the advantage of an immense amount of others' experience and the brightening light of science focused upon their problems.

Millions in Results.

The annual tabulation of results shows an enrollment of hundreds of thousands of women and girls. The containers of canned, dried, preserved, cured, and brined products and the pounds of fresh products grown and put up by these workers from the gardens, orchards, vineyards, poultry yards, and farms are measured in millions. Better kitchen and labor-saving devices acquired through the influence of the work are reported in thousands, while such equipment



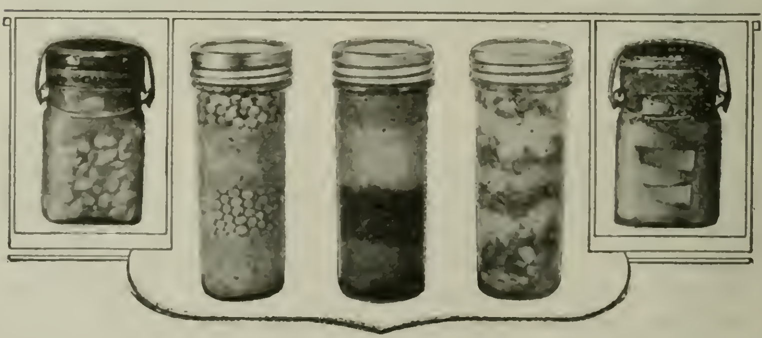
The Agent on the Road—Then and Now.

as waterworks, lighting and heating systems, washing machines, sewing machines, pictures, draperies, rugs, and other furnishings are also reported in thousands. New homes, rebuilt and rearranged homes, with their beautiful lawns and harmonious farmsteads, are told in columns of five figures. There has been a growth of the group idea because of the common purposes; there are now thousands of clubs and an evolution of community organizations, based upon such a foundation as gives promise of a better national life and a fuller civilization.

The Home Demonstration Agent.

But what about the pioneer agents who inaugurated and established a new system of education like this? What kind of profession have they and their worthy successors given to the world? Travelers from abroad declare it is different from the itinerant teaching of other countries, because it is based upon the theory of object lessons by the people themselves, in their homes and on their own farms. The agents proceeded upon the well-defined belief that it was not so much what they could do themselves as what they could get other people to do that would constitute value and service. They knew that what a person hears he may doubt, what he sees he may possibly doubt, but what he does himself he can not doubt. The work carried conviction first to the thousands who did it, and afterwards to the millions who saw the concrete examples of it. The qualifications, as manifested by these devoted servants themselves, as they have moved about among the people, are difficult of definition because they are still growing. Suffice it to say that thus far they have developed a composite picture and in it is revealed at least some of the equipment and abilities of all of the following: Coach, trainer, and guide; gardener, orchardist, and farmer; cook, seamstress, and dietitian; carpenter, cabinet-maker, and mechanic; missionary, sanitarian, and health officer; chorist, colporteur, and recreationist; ambassador, diplomat, and financier; and florist, architect, and artist.

Standard Packs.



KNOW YOUR MARKETS

By W. A. Wheeler,
Specialist in Market Information, and
Frank George, *Assistant in Market Information.*

AGRICULTURAL market reports were published as early as 1800, but it was not until 1858 that market reports were issued by an agency whose sole interest in the markets was to gather and disseminate news. The author of this new departure was a young New York printer who believed that if he himself collected market information and presented it from an unbiased viewpoint he could secure a sufficient number of subscribers to make the service a paying proposition. A number of produce dealers were canvassed for subscriptions, and in 1858 the first weekly edition of the publication was issued. The demand for the reports became

DO YOU WANT to sell your potato crop?

Do you want to buy large quantities of eggs and butter?

Are you on either the buying or selling end of the market for fruits, vegetables, live stock and meats, grain, hay, feed, cotton, or wool?

If so, what you need is accurate market information furnished by an unbiased agency.

Widespread market information of this kind helps all concerned—producers, distributers, consumers.

The Bureau of Markets reports on every commodity that constitutes an important part of the Nation's food and clothing supplies.

so great that beginning in 1882 the journal was made a daily publication.

It is quite a span from 1858 to 1910, but this was the era of the development of scientific and intensive agricultural production methods. The sales end of the farm business was something about which the farmer admitted he knew little. His job was finished when he grew the crops. The selling of them was a matter that took care of itself in the natural course of things. But about 1910 the farmer began to give thought to distribution problems. He became dissatisfied with existing selling methods and sought to improve them. Consumers, too, became concerned with the methods of distributing agricultural products, and the universal interest that was manifested culminated in 1913 in the authorization by Congress of the formation of what is now the Federal Bureau of Markets under the direction of the Department of Agriculture.

The marketing experts on the Bureau of Markets staff recognized from the first that the prompt reporting of national market information to producers, dealers, and consumers all over the country was one of the prerequisites of any improvement in marketing methods. Immediate work was begun toward that end, and in the spring of 1915 an experimental market news reporting service on perishable products was established. Market reporters were placed in the field and at consuming centers and daily reports were issued upon the movement and prices of a few agricultural products. Farmers and distributers everywhere acclaimed the service a boon to the produce business and upon every hand the Bureau of Markets was urged to expand the scope of its reportorial activities. Then, further authorized by Congress, the bureau established a permanent market news reporting service. Twenty-six temporary field stations were opened and city branch offices located in 10 large cities. The number of marketing specialists in the field and at market centers was increased, and reports upon potatoes, tomatoes, apples, peaches, and a few other commodities were issued daily.

From that small beginning—the daily issuance of mimeographed market reports upon a few commodities to 50,000 subscribers—the Bureau of Markets news reporting services have been developed to the point where to-day they embrace the reporting of market conditions in connection with 15 leading fruits and vegetables; all classes of live stock and meats at the country's principal live-stock and fresh-meat markets; all grades and varieties of hay, feed, and seed; dairy and poultry products at primary and consuming markets; wheat, corn, barley, oats, and rye at the four leading grain exchanges; cotton at 10 designated spot cotton markets and 2 future contracts markets; and other farm com-

There is a Commission Row in Every City.

For size and for volume of business transacted none compares with Chicago's South Water Street.

modities, such as wool, hides, and skins, as necessity demands. Foreign markets are also reported, representatives being located in Europe and South America for that purpose.

It Pays to Know Where the Need Is.

The chief function of agricultural market information is to regulate the flow of farm supplies to meet the demand. An understocked market in one place and an overstocked market somewhere else is hardly conducive to the best economic and financial welfare of the Nation, and with abundant supplies in the aggregate there is no good reason why such a condition should exist. Just how the dissemination of market news helps to prevent such a situation and directly benefits the farmer, the stockman, the distributer, and the consumer is amply demonstrated by a simple marketing transaction recently brought to the attention of the Bureau of Markets.

A certain Maryland farmer had always shipped his produce to Baltimore. His father had invariably traded in that market, and it had never occurred to the son to market his crops anywhere else. But a county agent was able finally to persuade him to study national market conditions, and the farmer subscribed to the market news service of the Bureau of Markets. He found that at that particular time the supplies of potatoes in the Philadelphia market were low, and learned that even with higher transportation costs to Philadelphia his net profit would be larger than if he shipped to Baltimore. He acted accordingly and secured an additional $150 of profit.

While that single shipment may not have reduced considerably the price of potatoes in Philadelphia, unquestionably it helped to place supplies more nearly in line with demand, and, had other Baltimore shippers followed a similar course, prices in Philadelphia would have been placed upon an equable basis with those in Baltimore. On the other hand, to have sent the potatoes to Baltimore at a time when the market was overstocked would have glutted that market and unduly depressed prices there.

The narration of this incident is not intended as an invidious comparison of the two markets, but simply to give a concrete illustration of the value of market information. At another time the situation might be reversed; Philadelphia might have an abundance of potatoes and Baltimore need some, a condition that would be immediately revealed in the Bureau of Markets reports.

Apply the principles involved in the foregoing transaction to the hundreds of thousands of marketing transactions that take place every day, whether in connection with fruits, vegetables, live stock, or other farm products, and the advantages secured by the dissemination of market information are plainly apparent. In the case in point the farmer's bank account was increased by $150, transportation and distribution agencies were legitimately employed, consumers were benefited, and the community in which the farmer lived was made financially stronger. Thousands of farmers and stockmen now use national market information as a guide to marketing their products. When all producers do so, much will have been accomplished toward establishing a system of distribution to meet efficiently our national requirements.

Interviewing the Jobbers.

Most of the produce arriving at New York City is sold to jobbers at the piers of the railroad companies. The omnipresent market reporter is second from the right.

The Bureau of Markets has in the United States 73 branch offices located at 46 large market centers, 16 of which are directly connected with the Washington office and with each other by some 4,500 miles of leased telegraph wires. Marketing experts keep in constant touch with market conditions in the field and at consuming centers and at least 15,000 responsible individuals, firms, and railroads—voluntary reporters—render reports to the bureau regularly upon the marketing of farm products. Mimeographed reports are still sent to producers and the trade direct, but by the use of the telegraph and the press and latterly of the wireless, these and the other reports sent out by the Bureau of Markets are received by not less than 15,000,000 potential readers.

The Market Reporter.

The medium through which the Bureau of Markets reports in popular, narrative style the combined results of all its market-reporting activities in connection with leading farm products throughout the United States is The Market Reporter. This paper is a 16-page weekly publication containing market reviews upon fruits and vegetables, live stock and meats, dairy and poultry products, grain, hay, feed and seed, cotton and wool, and general foreign markets information. The Market Reporter has been in existence since January 1, 1920, and is the direct outgrowth of earlier publications issued by the Bureau of Markets in more limited fields. On July 1, 1920, the distribution of the publication was placed upon an "individual-request" basis, and since that date its circulation has jumped more than 100 per cent, 33,000 individual subscribers having specifically requested that the publication be sent to them regularly.

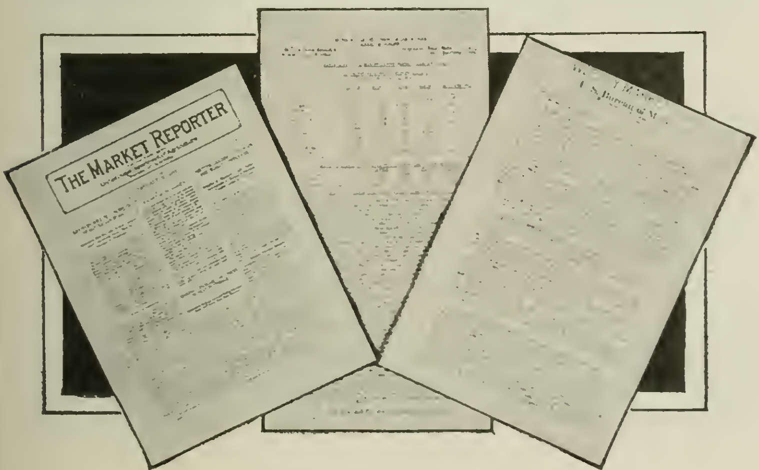
The articles upon market conditions published in The Market Reporter are prepared by some of the most expert marketing specialists in the United States. These articles deal with supply and demand, transportation, marketing practices and credits, and the multitude of other factors that control the marketing of farm products. Comprehensive weekly and monthly summaries of movement, marketing, and prices of specified commodities are published, as well as tabulated statistics that are accompanied by interpretative text, in an effort to present the figures in a form convenient for comparative studies through successive issues and volumes.

Producers, distributers, and students of agriculture have come to regard The Market Reporter as an authoritative guide in the field of distribution. From the standpoint of marketing the products of their farms, producers have found the articles printed in The Market Reporter of great value. One letter received recently from a farmer in the West stated that the information pertaining to market prices and conditions secured through its columns would be the means of saving thousands of dollars to the farmers in his neighborhood each year. A similar instance of saving reported to the bureau is that of a farmers' exchange in New Jersey which wrote that as a result of reading in The Market Reporter "a very interesting article covering the cottonseed meal situation, stating that stocks were heavy and giving other interesting data, we decided to wait with the placing of our order and bought part of our requirements last week, which meant a saving to us of something like $2,000 on 10 carloads."

The "Marketgram" Service.

To be of greatest value market information must be received by the producer as soon as possible after the close of the markets. With that end in view the Bureau of Markets maintains a special telegraphic market-reporting service to producers direct, the producers paying only the telegraph tolls. Then there are the "C. N. D." services of the commercial telegraph companies, whereby a producer may receive Bureau of Markets live-stock reports at stated intervals during the day upon payment of a telegraph fee to the telegraph companies. The bureau's mimeographed reports sent by telegraph to its branch offices and thence by mail to producers are usually received upon the morning following the day's business.

A recent departure in the field of market reporting is the publication of weekly summaries of market conditions at the



important producing and consuming centers. In a single report, only 1,000 words in length, are summarized national market conditions and prices on fruits and vegetables, live stock and meats, grain, hay, feed, and seed, dairy products, and cotton. These reports, known as "Marketgrams," are compiled from telegrams received at the Washington office of the Bureau of Markets from hundreds of regular and voluntary reporters, and treat of trend of conditions and prices, briefly and concisely presenting to the reader, almost at a glance, a picture of the entire marketing situation. No statistical data are given in these reports beyond important changes in the week's range of prices.

"Marketgrams" are issued on Monday, Wednesday, Thursday, Friday, and Saturday of each week and cover the markets for the preceding seven days. At 5 o'clock on the days of issue the reports are dispatched over the leased telegraph wires of the Bureau of Markets to its branch offices and thence released immediately to farm papers and other publications which have requested them. More than 5,000 such publications, with a combined circulation of at least 10,000,000 readers, receive and publish the reports, several foreign-language newspapers being among the subscribers. Any newspaper or farm journal that is not now publishing the "Marketgrams" would probably be glad to arrange to do so if its readers requested the service.

The Wireless Service.

Although there are thousands of subscribers to these services, they represent but a small proportion of all the agricultural producers in the United States. The aspiration of the Bureau of Markets is promptly to place daily national market information in the hands of *all* producers, and it is now experimenting with the wireless to determine the practicability of utilizing that medium of dispatch.

Through the cooperation of the United States Bureau of Standards the Bureau of Markets recently made arrangements for sending "Daily Radio Marketgrams" from the Washington radio station of the Bureau of Standards. These reports are 600 words in length and give daily market conditions and prices with regard to live stock and meats, grains, hay, feed and seed, fruits and vegetables, and dairy products. The Chicago live-stock and fresh-meat markets are reported as well as three eastern fresh-meat markets. Of grain, prices and conditions at the Chicago, Minneapolis, Kansas City, and Winnipeg markets are given. The fruit and vegetable information is obtained in a manner similar to that employed in the case of the "Marketgrams." Of hay, feed, and seeds, conditions and prices at the principal eastern markets are

A Temporary Lull on the Kansas City Board of Trade.

A moment hence and collars may wilt and buttons begin to fly.

reported, and of dairy products the New York butter market and the Wisconsin primary markets are quoted.

The "Daily Radio Marketgrams" are wirelessed at 5 p. m. each business day, and are received by hundreds of amateur wireless operators within a 200-mile radius of Washington. These operators relay the information to farmers, farmers' organizations, shippers' organizations, newspapers, and others concerned with the marketing of farm products. Certain newspapers have installed wireless equipment to receive the reports direct and other newspapers are making similar arrangements. A number of producers and newspapers have made arrangements with wireless operators for the receipt of the information, and several public institutions such as State bureaus of markets and high schools are regularly receiving the reports with their own equipment. In conducting the experiment the Bureau of Markets has the benefit of the experience and advice of some of the Nation's foremost wireless experts, and marketing agencies everywhere are watching the work with great interest.

Commodity Reports.

The reportorial activities of the Bureau of Markets, which make these composite services possible, are separated into sections according to the various branches of agricultural production. Thus, the fruit and vegetable division has its own staff of experts who report upon market conditions on fruits and vegetables only. The same is true of live stock and meats, dairy products, hay, feed and seed, cotton and wool, and foreign marketing conditions. Each section issues detailed daily, weekly, and monthly reports that are sent to producers, distributers, press associations, and newspapers specifically interested in the particular commodities covered, and separate mailing and telegraph lists are maintained at the Washington and at the branch offices for this purpose. The Bureau of Markets also issues reports upon the marketing of honey, peanuts, and a number of other farm products.

Fruits and Vegetables.

Of the news reporting services, the reporting of the fruit and vegetable and the live-stock and meat markets is the most comprehensive. In 1918 the fruit and vegetable division had 32 permanent market stations and 71 temporary field stations located in 40 States. Thirty-eight farm commodities were reported upon and 23,000,000 daily bulletins issued to some 125,000 producers, shippers, and produce dealers. But by reason of curtailments of congressional appropriations for this work, the fruit and vegetable market reporting activities were subsequently contracted, and during the past year the number of permanent market stations was 14 and of temporary field stations 42. The number of subscribers for the daily reports totaled 75,000, with a proportionate reduction in the number of reports issued.

Market experts in the field and at consuming markets render daily reports of conditions and prices to the several branch offices, which telegraph the information to the Washington office. The Washington office then summarizes the news and the same morning dispatches the summarized report to the various offices by telegraph, whence copies are mailed to producers and members of the trade direct. At a number of market stations valuable local service is also given by reporting to producers and distributers upon a much

Produce Market Reporters Must Be on the Job Early to Get a Line on the Day's Business and Prices.

wider range of commodities than it is possible to include in the national news service. These local reports indicate the daily supplies on the particular market, local jobbing prices, and sometimes retail prices. At the more important market stations a special telephonic and telegraphic service is maintained for the purpose of furnishing members of the trade with information more quickly than through the mimeographed bulletins. The subscribers pay the telegraph charges of this service, and the fact that the number of subscribers is constantly increasing attests its value and popularity.

Local newspapers also print in their market columns extracts from these reports, and in this way a large number of readers who are not specifically interested in receiving the detailed reports distributed by mail are reached.

During the period of important car-lot movement in the leading producing sections throughout the country, daily market reports are sent by telegraph to growers and shippers in the localities concerned, the receivers paying the telegraph

Putting the News on the Wire.

A staff of expert telegraphers at Washington dispatches daily market reports over 4,500 miles of leased telegraph wires to 16 branch offices.

tolls. These telegraphic reports give shipping-point information from competing sections in comparison with local f. o. b. reports and include reliable information regarding supplies and prices in important markets. With such information the producer knows precisely when and where to ship his products, a service that is obviously of value from both an economic and financial viewpoint.

A crop and market review of fruits and vegetables that is largely a summary of the information given in the daily reports is issued once a week. This report shows the price ranges and general market tendencies at shipping points and in consuming centers, and treats of the car-lot movement of the various commodities to the markets. Two hundred local voluntary correspondents and a number of State reporting agencies also report crop conditions in their particular territories, which information is summarized and made a part of the weekly review. The review is prepared at the Washington office, sent over the leased telegraph wires to all branch offices, and 5,500 copies distributed among producers. shippers, transportation officials, and members of the trade. Copies are sent to daily newspapers and trade journals also.

By an arrangement with 474 transportation lines, including steam and electric roads, boat lines, and express companies, the Bureau of Markets receives daily reports of car-lot movements of 36 important crops. During the fall, when car-lot movements are at their height, as many as 300 telegraphic reports of this nature are received daily. In the lighter seasons of the year the reports are not so numerous, but for a 12-months period the average number of daily reports from these sources is about 175. Not only are the shipments reported by States of origin, but all primary destinations are reported as well, a feature that very greatly increases the value of the reports, especially to the field stations issuing market information in producing sections. This information is dispatched over the leased-wire circuits before 9 o'clock each day and thence relayed from the branch offices to producers, shippers, and others interested. A weekly summary of car-lot shipments is also sent to a special list of subscribers composed largely of transportation officials, members of the trade, educational institutions, and others interested in such statistics.

A weekly article featuring the leading news developments of the fruit and vegetable market is also issued on Friday afternoons and distributed to press agencies through the press service of the Department of Agriculture. This review is prepared for general readers and is used by numerous important newspapers that do not publish the more technical market reviews. A monthly review is similarly prepared, going to about 50 periodicals and press associations, and appearing in newspapers having an aggregate circulation of 600,000 readers.

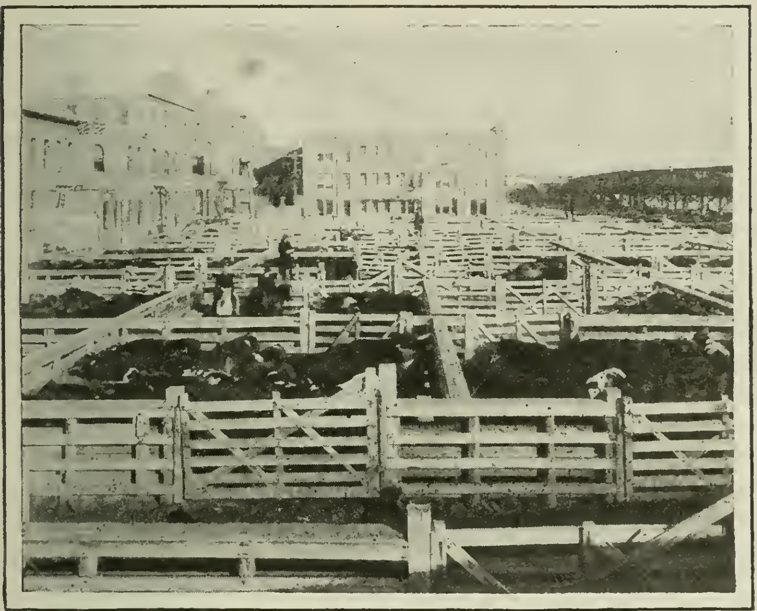
Live Stock and Meats.

Ten million potential readers receive the Bureau of Markets live-stock and meat reports every day. This vast circulation is obtained by means of mimeographed reports sent to producers direct, the daily newspapers, the commercial news services of the commercial telegraph companies, and the dispatch of the market news by "ticker" service out of Chicago.

The various press associations place a high value upon the accuracy and unbiased nature of the bureau's reports, and every day a 110-word live-stock report prepared by the bureau is dispatched from each of the five leading live-stock markets to thousands of newspapers over the leased-wire circuits of these associations. The commercial telegraph companies have a special market reporting service known as the "C. N. D."—Commercial News Department—service whereby current market information on live stock, grain, and other commodities may be had by subscribers at stated hours during the day upon payment of a small monthly charge. Before the Bureau of Markets reported the live-stock and wholesale meat markets the telegraph companies obtained their information from various individuals, many of whom were biased by reason of having assumed a position in the market. These companies now receive the market news from the Bureau of Markets, and, during the past three years, thousands of additional names have been placed upon the subscription lists of the "C. N. D." services.

The subscription lists for the mimeographed reports contain some 10,000 names of producers, cooperative organizations, dealers, commission men, meat packers, and others. To insure prompt delivery of these reports their preparation and issuance are timed so as to catch the fast mail trains.

To make possible the service outlined above, which members of the trade affirm is the best service of its kind yet available, the live stock and meats division maintains eight branch offices in the eight largest live-stock and fresh-meat centers of the United States. At Chicago, Kansas City, Omaha, St. Paul, the National Stock Yards in Illinois, New York, Boston, and Philadelphia trained market reporters and telegraphers are located and at stated periods each morning designated reports of market conditions are released. These branch offices are connected with each other and with the Washington office by leased telegraph wires, approximately 2,375 miles of wire in all, extending from Boston in the east to South St. Paul in the north and Kansas City and East St. Louis in the south, thus linking five of the largest live-stock markets and four of the greatest meat-consuming centers in the country.



Part of the Chicago Stockyards.

More than $3,000,000 of business is transacted at the Chicago live-stock yards every day. The man "on the fence" is reporting a sale for Uncle Sam's nieces and nephews.

Each office has one or more bulletin boards located in conspicuous places about the market and upon these boards the day's market news at all the markets is bulletined as fast as it comes over the leased telegraph wires. Producers, shippers, traders, and consumers consult these boards constantly and are kept informed of movements, prices, and general trade conditions in the particular kind of live stock or dressed meat in which they are interested.

The Chicago live-stock market is by far the most important live-stock center in the world. Here an average of $3,000,000 of business is transacted every business day and, except for temporary local conditions, prices at most of the other live-stock markets throughout the United States are based largely upon the prices prevailing at this market.

At 4.30 a. m. every day, at the Chicago office, a representative of the Bureau of Markets telephones the office of every railroad entering Chicago and receives a statement of the number of cars of each kind of live stock near enough to Chicago to arrive during the trading day. To this total is added the number of carloads that arrived during the night. With this information and his knowledge of the kinds of live stock shipped from different sections of the country at different seasons and of the number of animals usually loaded in a car, the bureau's representative is able to estimate accurately the number of animals of each kind that will reach the market that day in time to be offered for sale. Inasmuch as the day's trading is based very largely upon this estimate, it is essential that it be as accurate as possible. The report on the estimated receipts must be ready for release at 6 a. m., central time, and is of special interest to eastern buyers who wish to place orders for stock.

Prior to the time the bureau began making these estimates the trade had to depend on reports released by individuals, who often were interested in buying or selling live stock and whose information was limited. The fact that often widely varying estimates were released simultaneously by different individuals, thereby confusing the trade, indicated the necessity of having the estimates made by an unbiased ageny such as the Bureau of Markets which has authority to obtain the information needed on which to base the estimates. In making its estimates the bureau is greatly indebted to the officials of the railroads entering the markets for their hearty cooperation in furnishing information.

Through the cooperation of the railroad officials, the bureau has been able also to perfect arrangements whereby an advance estimate of the following day's receipts can be released shortly after the noon hour. This estimate, while not always as accurate as the report released at 6 a. m. the day the animals are due, is of great value to shippers and others. The accuracy of both estimates is constantly improving, as indicated by the steadily decreasing variation between the estimated and actual receipts. A second estimate of receipts is released at 7 a. m., and incorporates any changes or additions subsequently reported by the railroads.

As buyers and sellers are in the market ready for business before 8 a. m., the bureau's reporters must be on the job before that hour to get the opening sales and observe the market trend so that the "opening hog market" report may be placed on the wire by 8.30. Bureau representatives cover the cattle market, hog market, and sheep and lamb markets. These men must be not only trained market reporters, but good judges of live stock, able to determine at a glance the various classes and grades of the animals that are sold.

At 9.10 a. m., the "hog flash," a brief report on the condition of the hog market at that hour, is sent out. At 10.30 a. m., a detailed report that gives market and trade conditions in the cattle, hog, and sheep markets, together with complete estimated receipts and detailed quotations on various classes and grades of each species, is dispatched. The closing wire for the day is released between noon and 2 p. m., and contains information as to any changes which may have taken place after 10.30 a. m. In addition, brief summaries of the day's trading are prepared for the press associations, to be sent to the afternoon and morning newspapers.

Dairy and Poultry Products.

Daily and weekly butter and cheese market reports, daily egg and dressed-poultry market reports, and monthly export, cold-storage, and condensed-milk reports are sent direct to some 13,000 persons and firms in the dairy and poultry products business. A number of creameries and cheese factories sell their products exclusively on the basis of the prices set forth in these reports. Wholesalers and jobbers find the reports useful in keeping informed of general trade conditions, and dairymen who study dairy marketing conditions throughout the country state that the monthly report of prices paid to milk producers is of great value to them.

The division of dairy and poultry products has branch offices at New York, Chicago, Philadelphia, Boston, San Francisco, Minneapolis, and Fond du Lac, Wis. By a cooperative arrangement with railroad, steamship, and other transportation officials, each of the four eastern branch offices obtains by telephone each morning statements of receipts of butter, cheese, eggs, and dressed poultry for the preceding 24 hours. Each branch office also each morning secures a preliminary report of the quantities to be delivered for unloading that day, a service that is of especial value to the trade in the immediate markets. Daily reports of the quantities of butter, cheese, eggs, and dressed poultry received in cold storage, the quantities delivered, and the quantities remaining in storage are similarly obtained, the composite report representing the cold-storage movement in more than 45 of the largest warehouses in the United States.

Trained market reporters are located in the markets and each day obtain statements of quantities of butter, eggs, and cheese stocks on hand, more than 150 firms providing this information in New York alone. Reports of current trading stocks of cheese holdings at country warehouses in Wisconsin as well as stocks on dealers' floors in the distributing markets are also secured. All wholesale prices reported are of actual sales in the markets, this information being obtained by the reporters at the close of each day's trading. Price reports on cheese at Wisconsin primary markets are handled by mail from the Fond du Lac office. The several branch offices, save San Francisco, are connected by leased telegraph wires, and as soon as the reports are prepared they are dispatched over these lines for immediate distribution.

In addition to the cooperation of dealers and wholesalers, more than 300 milk dealers' and milk producers' organizations located in more than 100 of the principal cities of the United States inform the division of the prices obtained for milk, which has made it possible to issue a monthly milk-price report that is used by milk producers everywhere to ascertain the general price trend. The monthly condensed-milk report is compiled from information obtained from about 350 condensed-milk manufacturers. Similarly, the quarterly production report is the result of direct cooperation with 10,000 firms manufacturing dairy products.

Not only do sellers of dairy and poultry products use the reports, but large buyers, such as hotels, restaurants, and public institutions, use them as a check against prices. A recent instance of this is of a well-known educational institution which uses large quantities of butter in its dining halls. The college became dissatisfied with its arrangement with a butter firm that furnished the supplies, and consulted the Bureau of Markets. As a result the institution incorporated in its purchasing contract a clause providing for settlements on the basis of Bureau of Markets reports and Bureau of Markets inspection, and the arrangement has worked out to the satisfaction of both parties.

Cotton.

In December, 1919, the cotton division began a cotton quotation service for the purpose of keeping cotton growers informed of general conditions and prices at the spot cotton and future contracts markets. Weekly bulletins are issued at Charlotte, Atlanta, New Orleans, Memphis, and Dallas to some 1,500 subscribers. The information contained in these reports is reported to the representatives of the Bureau of Markets by reliable agencies, and the prices set forth are generally on the basis of official cotton standards as provided in the United States cotton futures act. The reports state the daily prices for the various grades of spot cotton, the daily prices of future contracts at the New Orleans and New York markets, prices of staple cotton, and prices of cotton seed. Each report also invariably contains information of a general character, including approved methods of preparation of cotton for marketing. Among the subscribers for these reports are cotton growers, dealers, cotton-goods manufacturers, banks, and even shoe manufacturers.

An illuminating instance of the salutary effect of the reporting of the cotton markets by an unbiased agency occurred recently. At Little Rock the price of spot cotton was considerably lower than the price at Memphis. The sellers at Little Rock did not know this and were selling at the lower figure. But when the current market report of the Memphis office of the Bureau of Markets was received at Little Rock, the price of spot cotton on the Little Rock market advanced sufficiently to place the two markets on a parity and more closely in line with current values.

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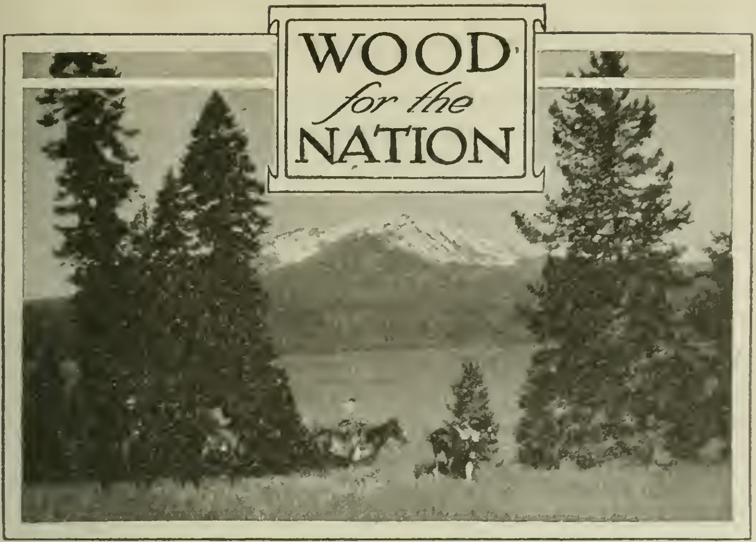
Wide Scope of Market News.

The Bureau of Markets endeavors, with the facilities at its command, to cover the markets upon every farm commodity which constitutes an important part of the Nation's food and clothing supplies. This service is maintained for the express benefit of producers, distributers, and consumers. Never before has there been so great a demand for accurate, timely, and comprehensive information regarding agricultural markets. Individuals, organizations, and institutions concerned with production and distribution are constantly calling upon the Bureau of Markets for market information. Farmers' organizations—national, State, county, and local—all have come to appreciate the necessity for accurate market news, and are persistently requesting information, both domestic and foreign, that will aid them in marketing their crops. They have come to recognize that it is impossible for them either to sell or to buy farm products intelligently without having accurate market information furnished by an unbiased agency. In the endeavor to meet these demands the Bureau of Markets strives not only for accuracy and completeness in assembling market information, but for its prompt, widespread, and efficient distribution.

WOOD *for the* NATION



By W. B. Greeley, *Forester, Forest Service.*

IT HAS often been thought that the days of the log cabin and open hearth represent the period in our national development when a liberal supply of wood was most necessary; or if not the earliest pioneer days, the time of rapid settlement when new land was being brought under the plow, farmsteads constructed, and new towns appearing on the map. The countries of Europe whose social and industrial development runs some centuries back of our own use but one-third or one-half as much wood per capita as the people of the United States; and at first blush this would indicate that the older we get as a nation the less dependent will we be upon our forests. But this rule does not fit the American people. The older our States and communities grow, the more timber will they require in one form or another if social and industrial progress are to keep pace with age.

Recently I had a wonderful glimpse of the citrus belt of Florida, representing as highly developed agriculture as one would find in the world. I saw square miles of recently planted orchards stretching over the rolling hills of the Florida Peninsula. To market the present citrus crop takes 13 million boxes yearly, and each box requires 5½ board feet of wood. I learned that within five years over 20 million boxes and within ten years over 40 million boxes will be required every year to put the southern citrus crop upon the market, wholly apart from the quantities of lumber needed in farm improvements. One of the serious problems of both the citrus and truck industries in Florida, which certainly do not represent pioneer agriculture, is a supply of wood in the future sufficient to market their products.

We Want More Wood.

The average well-kept farm in the upper Mississippi Valley uses 2,000 board feet of lumber every year for repairs and improvements. This yearly use of lumber represents probably the minimum requirement of efficient twentieth century agriculture. Turn to our manufacturing communities. Industrial centers like Pittsburgh, Chicago, or St. Louis consume from two to four times as much lumber per

> The largest owner of timberlands, the largest user of timber, is the farmer.
>
> Wood means more to him than to anyone else.
>
> It will pay him to put his idle land to work growing timber.

capita as the country at large. To maintain our railway systems requires 125 million wooden crossties every year, and the more railroads we build the larger does this permanent requirement become. And our use of paper, which is made largely from wood, has grown by leaps and bounds. In 1880 the average person in the United States used about 30 pounds of paper every year; to-day the average American uses 125 pounds every year.

Many substitutes for wood in one use or another have been devised, and yet the aggregate demands of the country for timber are growing all the time. More wood is used in houses than before the discovery of concrete. More wood is used in constructing railway cars than before the steel car or car constructed partly of steel was developed. And constantly new chemical or mechanical processes are being developed in the utilization of wood, which enlarge its range of utility and increase demands for the raw material.

A Comfortable House and the Morning Paper.

The United States produces over half of the entire lumber cut of the world, and uses 95 per cent of that amount right here at home. The difference between this country and the countries of continental Europe in the use of wood is not the difference between a young nation and old nations; it is the difference between a country with high standards of living and rapid industrial growth and countries of low standards of living and industrial conditions largely fixed and unchanging. Picture an average rural section in France, such as American soldiers have seen many times, where a new structure of any kind is a rare sight, and mean, moss-covered stone buildings of the time of Jeanne d'Arc must serve the needs of the French farmer of to-day. With all its beauty and picturesqueness, you carry away an impression of economic decadence, of low standards of living and inefficient methods of farming under which life is possible only by frugality and restrictions on comfort unknown to the masses of the American people. Compare this picture with the average rural section in New York or Minnesota or Iowa, and you will understand the difference between a country where wood has been plentiful and a country where wood is classed almost with the luxuries.

Abundant and widely distributed forests have meant to the United States comfortable homes for the masses of our people beyond the standards of any other nation on earth. They have placed newspapers and magazines on the average family table. They have contributed largely to living and social and industrial conditions which make for democracy and constructive energy—rather than the discontent, the limitations on opportunity, and the destructive social forces bred by conditions of life that are mean and hard and comfortless.

The aftermath of the war has brought home very sharply the menace to American prosperity and standards of living threatened by inadequate supplies of timber. The country is short to-day 1,250,000 homes. This shortage is a direct outgrowth of the scarcity and high cost of lumber, together with other building materials, during a period of about three years. The lack of dwellings resulting even from this temporary shortage is a serious problem, involving exorbitant rents, overcrowding, lowered standards of living, and a weakening of the family influence. Make the lumber prices of 1920 permanent and one can readily appreciate what the home conditions of the American people will become in a couple of decades.

In 1919 and 1920 the lumber normally used in farm improvements in the upper Mississippi Valley reached such a cost that the construction of new farm buildings fell off one-half and the repair of farm improvements fell off one-third from the normal use of lumber in that region. Project such a shortage over 25 years, resulting from a permanent scarcity of timber rather than a temporary condition of the lumber market, and the injury to living conditions in rural America and the efficiency of our agriculture will be serious.

Reaping Where We Have Not Sown.

These are days when the whole world, more or less, is taking stock. A crisis like the great war often brings home forcibly weak points which were not appreciated during the easier years of peace. And one of these weak points is that while we are preeminent in the world as a nation of wood users, we are not a nation of wood growers. We are beginning to feel the full effect of the prodigality with which we have used up our virgin forests without replacing them.

Three-fifths of the forests which sheltered America's aboriginal inhabitants are gone. From the remnant we are now cutting yearly at least four times as much wood as is being grown. We are even cutting trees too small for the sawmill more rapidly than they are being produced. The American sawmill has moved over the face of the land, cleaning up one forest region after another. About 5 per cent of the virgin forests of the New England States is left. In 1850 New York held first rank among the States as a lumber producer; to-day she imports probably 90 per cent of the forest products required by her own people and industries. In 1860 Pennsylvania stood first in the cut of lumber and exported large quantities to her sister States. The lumber cut in Pennsylvania now is less than the requirements of the Pittsburgh territory alone. By 1892 the Lake States had become the great lumber camp of the country; to-day their cut has dropped to a single billion feet, and of their vast pine forests about 2 per cent is left.

There are not many more chapters in this story. The pine belt of the Southern States is now our greatest source of lumber, but that region has also passed its peak and all the evidence goes to show that within another 10 or 12 years the Southern States will have little lumber for export. Fifty per cent of the timber yet standing is in three States border-

The Source of Many Comfortable Homes.

Abundant and widely distributed forests have meant to the United States comfortable homes for the masses of our people beyond the standards of any other nation on earth.

ing the Pacific Ocean. The westward movement of forest industries is becoming more accelerated every year; and every year constantly greater quantities of lumber are being hauled 2,000 or 3,000 miles from the sawmill to its consumer. The average freight charge on lumber to-day amounts to more than the lumber itself cost 30 years ago.

Use Plenty and Grow Plenty.

It is fruitless to decry this generous use of our forests which has contributed so largely to the growth and commercial leadership of the United States. The exhaustion of our timber supply is coming about not because we have used our forests freely but because we have failed to use our timber-growing land. The problem in a nutshell is the enormous

Sand and Brush.

All that is left of a great pine forest in the Lake States.

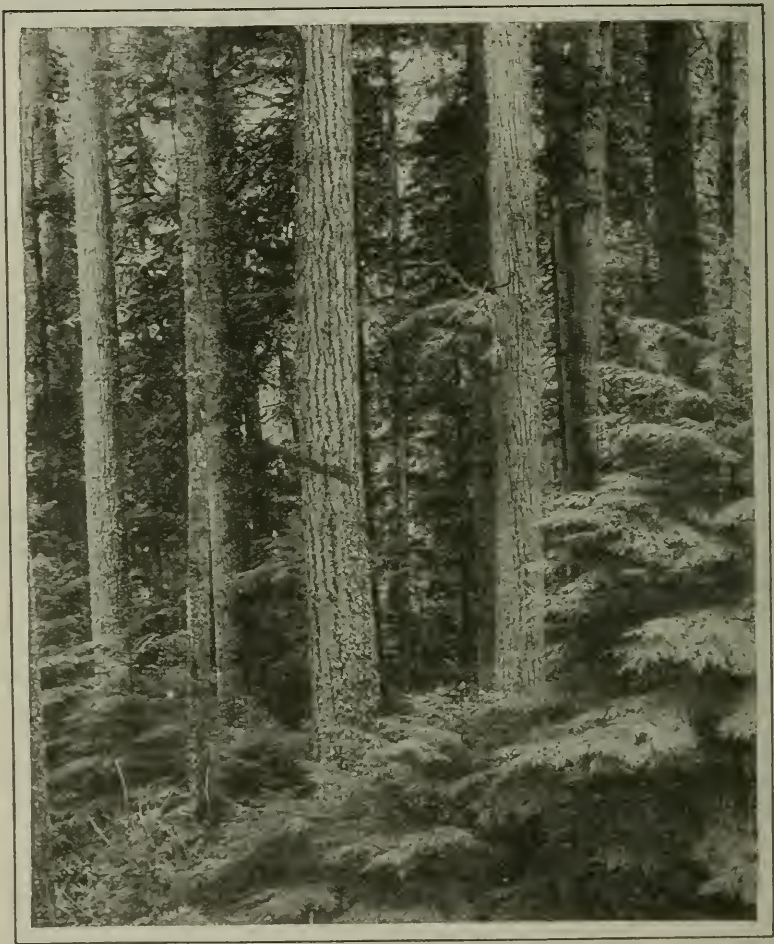
area of forest land which has been so logged and so burned that it is producing little or nothing. We have over 80 million acres, an area greater than all the forests of France, Belgium, Holland, Denmark, Germany, Switzerland, Spain, and Portugal, which has been denuded to the point of absolute idleness so far as the production of any timber of commercial value is concerned. We have other enormous areas of cut-over land now growing but a fraction of the amount of timber which they might produce. And we are adding to these areas of idle or largely idle land from 10 to 15 million acres every year, as destructive logging and still more destructive burning progress.

The United States contains some 465 million acres of forest land of all sorts, timbered, cut-over, and burned. Most of this will always be forest land. Its area is ample to grow all of the wood needed for our own use and for our export trade if it can be kept at work growing trees. The forest problem of the United States is primarily the problem of millions of idle acres. If steady work and steady production constitute the lasting and effective cure of the economic evils of the world, let us not overlook the national loss we are now suffering through the idleness of a large part of our land which might be growing timber. Idle acres of timber-growing land may mean just as great a loss to the economic stability of this country as idle farms or idle factories.

In other words, if we are to remain a nation of wood users we must become a nation of wood growers. This is peculiarly a national problem. There is no commodity in which our different States are more dependent upon one another than the products of the forest. Our most densely populated industrial States like Pennsylvania, New York, and Massachusetts import from 60 to 90 per cent of the timber which they use. One of our most highly developed agricultural sections, in the Middle West, imports almost 100 per cent of the timber which it uses. Half a dozen States supply the whole country with paper. The beehive of wood manufactures in the vicinity of Chicago, Milwaukee, and Detroit would have to close down in a few weeks were their lumber supply from Southern and Western States cut off. In other words, timber supply is coming to the fore like our coal supply, like the development of agriculture, like our interstate transportation system, like our marine transport, as an economic problem affecting all interests and sections, as a problem which must be *viewed* from the national standpoint and *dealt with* from the national standpoint. We will get nowhere if we conceive of it as a problem of this or that particular locality.

We Can Not Leave It Alone.

Nor can we solve this problem by the old economic theory of leave it alone. Considerable reforestation comes about by chance. Areas in the South Atlantic States are now yielding



The Last Great Commercial Forest.

Three-fifths of the virgin timber of the United States is gone. Half of what is left is in the three States bordering the Pacific Ocean.

their third cut of saw timber in spite of the prevalance of fires and other destructive agencies. Considerable reforestation is coming about through the intelligent action of landowners. There are not a few holdings in our north woods which have produced yields of saw timber and pulpwood through three generations of owners. Year after year the planting of denuded lands is increasing. It is safe to say that 12 or 15 million young forest trees are planted annually in the New England States and probably as many more in the Middle Atlantic and Central States.

Such instances of reforestation through private initiative are indeed encouraging and should receive every reasonable form of public assistance. But weighed in the balance against our national needs for timber, the production of wood by voluntary private effort is hopelessly inadequate and will remain so for a long time to come. It takes a long time to grow merchantable timber, and the vast public interests at stake can not, under a real national conception of the problem, be left to the turn of profit or loss or the business policy of the individual. We must devise some plan-wise system of reforestation, with enough public participation and assistance to make it effective, which will keep not an isolated spot here and there but our hundreds of millions of acres of forest land at work growing timber.

An obvious way of doing this is through the extension of publicly-owned forests. The National Forests now embrace 156 million acres, chiefly in the Western States. They are to-day the largest element of stability in our whole timber-supply situation because their timber will never be cut faster than it is grown. Several of the States have taken admirable steps in the same direction. New York owns nearly 2 million acres of State forests and State Parks, and Pennsylvania over 1 million acres of State forests under management. Massachusetts recently initiated a plan for the purchase and immediate planting of 100,000 acres of denuded forest lands within her borders. From every standpoint, not alone of economic needs but of conserving wild life and affording greater opportunities for recreation and health to the masses of our people, a large extension in public forest ownership, both State and National, is desirable. It is manifestly impossible, however, for the public to acquire all of the forest lands in the country. Four-fifths of our forests are now in private ownership, and in the nature of things a large proportion will necessarily remain in private ownership. Our future wood supply will be far from adequate unless some definite provision is made for keeping private woodlands in the continuous production of timber, on some basis equitable to their owners.

We have been very loath in the United States, with its abundant natural resources, to place any restrictions upon the freedom of the individual in using his own property. We have scarcely gone beyond restraints essential to prevent an actual menace to one's neighbors, like a fire trap in a thickly settled city, or a source of disease, or failure to exterminate noxious insects and plants.

The time has come to go a step further in our conception of the rights of the individual as compared with the interests of the people as a whole. Lands which contain important natural resources can no longer be viewed as merely the property of their owners, with no obligation to the welfare of the country at large. Rather should they be regarded, in a sense, as public utilities.

Put the Idle Land to Work.

By some means or other we must see to it that forest lands not needed for agriculture are not allowed to lie idle but are kept at work growing timber. Obviously regulations imposed upon timber lands must be reasonable and equitable to the owner; the owner of the land can not do it all. The public must aid him in overcoming the hazard of forest fires, which often makes the growing of trees a precarious venture. The public must recognize that the present methods of taxing growing forests in many regions are equivalent to taxing a farm crop twice a week during the growing season and may largely eat up the value of the timber before it is grown to marketable size. With the fire hazard reduced to an insurable risk, with the taxes on growing forests adjusted to a crop which requires 40 or 50 seasons to mature, we may rightfully insist that every owner of forest lands shall keep his land continuously in timber growth and there will be no practical reason why the owner of the land can not comply. The new principle which must be part of any adequate plan for nation-wide reforestation is this—require the forest owner to grow trees but give him fair and reasonable help in doing it.

At many points this great national problem touches the interests of the American farmer. Agriculture is the largest wood-using industry of the United States. Nearly 50 per cent of all the wood which the country requires is used on its farms, for buildings and improvements, for barrels, boxes, and other containers required in marketing crops, for cordwood, fencing material, and so on. Probably no other American industry would feel so quickly or suffer so severely from a continued shortage of timber.

And, on the other side, the farmers of the country taken together are its largest timber owners. Farm woodlots the country over reach the enormous total of 191 million acres,

Fire has ruined the forest and the land now lies idle and unproductive.

Destructive lumbering has ruined the slopes. A forest cover would help to regulate water run-off and would supply timber.

Idle Acres.

There is enough idle cut-over and burned-over land in the United States to grow all the timber we need. The answer to the forestry problem is not to use less timber, but to protect what we have and to grow more.

more than all the great holdings of commercial timberlands. In the States east of the Great Plains, 45 per cent of all the forests and 40 per cent of the merchantable timber form a part of farm holdings.

The farmer is proverbially the most independent of us all in the matter of foodstuffs; he might be equally independent in the matter of wood if his timber-growing lands were utilized with the same care and study as his orchards or grain fields. The woodlot has not figured largely in the development of scientific agriculture; often it has been regarded as wild land not yet reclaimed. Seldom has it been viewed as a permanent and productive part of the farm, to be taken seriously. The farmers of the country need to check the cords of wood or feet of timber which their woodlots are growing just as they would check the bushels of wheat which their fields are producing, and then improve the yields of their woodlots with the same intelligence and care that they apply to other crops, wherever the character of the land makes a permanent woodlot desirable.

The farmers of the United States are at one and the same time the largest consumers of forest products and the largest owners of forest lands. They have the most permanent interest in a systematic national plan of reforestation. They will find profit in taking their own woodlots out of the slacker class, and they may well take a hand in bringing about a common-sense plan of reforestation based upon necessary and equitable public control.

CONSERVING OUR WILD ANIMALS AND BIRDS

By Edward A. Goldman,
*Assistant Biologist, in Charge of Biological Investigations,
Bureau of Biological Survey.*

THE conservation of wild animals and birds is not a mere fad indulged in by those who have only a sentimental interest in the subject. It has a much greater importance, due to values difficult to measure but none the less real. Wild game especially is often of direct economic value to the inhabitants of a region, not only as food but also because of the expenditures of hunters and others attracted by its presence; and the recreational and educational advantages arising from an abundance of wild life in general are incalculable.

Millions of Hunters.

Many valuable forms of wild life have disappeared within recent years, or are now being threatened with extinction by the changing conditions brought about by man, especially by the general encroachment on their haunts accompanying his progressive settlement of the country, along with his too indiscriminate use of gun and trap. Modern firearms, including repeating or automatic shotguns and rifles, give the hunter an immense new advantage over the game. The automobile, better roads, extension of rapid transit, and finally the airplane, enable the hunter quickly to reach the most isolated places and have greatly reduced the natural seclusion so essential to the general welfare of many game animals. Furthermore, the game laws, in many cases still defective, are the more easily evaded through the use of these means of conveyance.

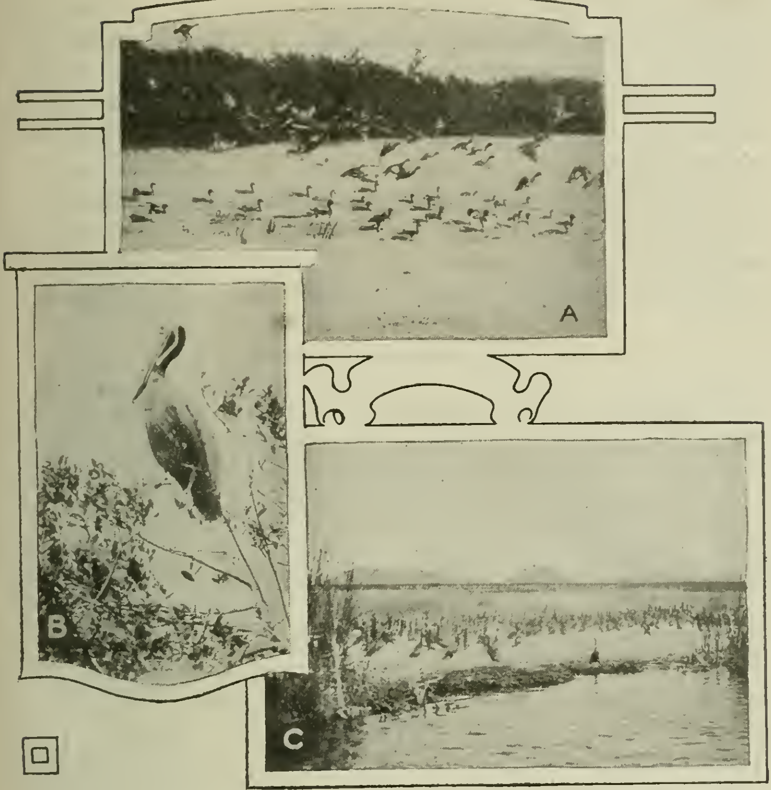
Some conception of the extent to which shooting is carried on may be gathered from reports received through State game commissions, which indicate that the number of licensed hunters in the United States in 1919 was 3,598,268. To this number may be added at least 1,500,000, representing those who, hunting on their own lands under the laws of certain States, require no license, and others who indulge in this sport illegally. This makes an impressive grand total of more than 5,000,000 who go out with the gun every season.

Conservation Based on Facts.

Much information has been accumulated concerning the various forms of animal life, but there is a steadily increasing demand for more exact knowledge of all the conditions affecting them, as a prerequisite to the solution of many problems almost vital in their bearing upon human welfare.

The research work of the Biological Survey, involving detailed investigation of the life habits and distribution of native wild animals and birds in relation to their environment, supplies the information necessary as a basis for many activities along special lines relating to agriculture, and for the formulation of Federal game legislation and suggestions for adoption in State game laws and regulations.

To maintain the game supply, and at the same time to provide if possible fair sport for the increasing number of hunters that may confidently be expected, is one task before us. Fortunately appreciation of the value of our wild life and recognition of the importance of conserving beneficial and harmless species, especially of birds and mammals, have become more general during recent years, and the demand more insistent for the protection of game. Through the efforts of game protective associations and individual conservationists, a more enlightened public opinion is resulting in better Federal and State laws and measures for their enforcement. Much remains to be done, however, to enlist the interest and local aid of the people everywhere, as without their cooperation the conservation of wild life becomes extremely difficult, if not impossible.



Bird Reservations and Their Occupants.

A, Mallard and pintail ducks on the Ward-McIlhenny Bird Reserve, Louisiana (photograph by H. K. Job, used by permission of the National Association of Audubon Societies); *B*, brown pelican, from photograph taken on Pelican Island, Florida, the first of the national bird reservations, established March 14, 1903; *C*, white pelicans and cormorants on the Klamath Lake National Bird Reservation, Oregon.

It has been the practice in many States to issue hunting licenses for the open season to all applicants, with too little regard for the available game supply of any particular area. The hunters may far outnumber the animals hunted within a given section, and under such conditions the extinction of big game especially is inevitable. With the disappearance of many of the kinds which favor the rougher, more inaccessible places little frequented by domestic stock, the utilization of available forage is less complete, and valuable natural resources are wasted. The Biological Survey advocates a limited license plan, based on annual estimates of game conditions in each district. This means that the number of big-game licenses issued for a given area in one season would depend upon the number of game animals which it has been determined in advance can be spared. Proper administration of this sort should conserve game in the greatest numbers consistent with the reasonable demands for local grazing and other interests and obviate the necessity for establishing perennial closed seasons, except on areas being restocked.

The Friendless Snake.

In one particular direction any sentiment in favor of conservation is slow to develop. The snakes have few friends. And no doubt this is excusable, though it results from lack of information. The popular prejudice against snakes, beginning with the story of the Garden of Eden and persisting throughout our historical period, has been fostered largely by the potential power of certain species to cause death through venomous bites. But the poisonous kinds are relatively few. While some snakes are known to be injurious, information concerning many species indicates that they are not only harmless but even beneficial and fill an important place in maintaining the natural balance. When people generally can distinguish between the dangerous or injurious and the harmless species, the indiscriminate killing so often indulged in will cease.

Protecting Migratory Birds.

Game birds are recognized as one of the most valuable of our natural resources. Most of the ducks, geese, and other waterfowl traverse thousands of miles in their migrations from the breeding grounds in the far north to their winter habitats in the south. On the way they stop to rest and to feed at many places, where they were formerly subjected in both spring and fall to such systematic slaughter by hunters that their numbers were alarmingly diminished. The banding of birds, a feature of migration work now being developed by the Biological Survey in cooperation with many interested ornithologists, to secure exact information about the movements of individual birds, has produced data that furnish some idea of the rate at which ducks are killed off by shooting. Of 240 black ducks, mallards, and blue-winged teals banded near Toronto, Ontario, between September 2 and November 10, 1920, about 10 per cent had been killed before December 23 of the same year. The bands were returned from localities extending in a general line south through the Mississippi Valley to near the Gulf coast, with outlying continental records as far east as the coast of North Carolina, the extreme being one from the island of Trinidad, British West Indies.

The end of waterfowl shooting as a permanent sport to be indulged in on a large scale seemed in 1913 almost in sight, owing to the depleted numbers of the birds. The problem was obviously international in scope, and the efforts of far-sighted conservationists in the United States and Canada finally resulted in what is known as the migratory-bird treaty, under which all migrant birds receive certain protection in both countries. The constitutionality of the migratory-bird treaty act was passed upon by the Supreme Court of the United States and sustained in a decision rendered April 19, 1920, a date which will doubtless become memorable in the history of wild-bird conservation in America. The most important features of the act prohibit spring shooting and the sale of migratory game birds everywhere in the United States.

The Biological Survey is charged with the administration of the treaty act and the regulations adopted under it, and although the number of Federal wardens that it has been possible to employ for the purpose has left much to be desired, gratifying results are already apparent. The active cooperation of many States and various game protective associations and individuals is tending to bring State game laws into conformity with the Federal regulations; and in this and in many other ways is contributing to the effectiveness of the work.

Hundreds of reports from widely separated parts of the country indicate that migratory wild fowl are now steadily increasing, their numbers being unusually large, especially in the Mississippi Valley and the Eastern States, in November and December, 1920. An example of the extent to which hunting under controlled conditions may be indulged in apparently without disastrous results is shown by the published report of the State Game and Fish Commission of Minnesota for the 1919 season. Of the 76,335 licensed small-game hunters in the State, 45,936 submitted returns indicating that 1,098,167 ducks, mainly scaups, mallards, and blue-winged teals, were shot, while the total of waterfowl killed by them alone was 1,282,881. The estimated total of ducks alone killed by small-game hunters was 1,804,900. As each duck may be considered to have a food value of 75 cents, the return from those reported killed was over $800,000. The great value of such game to the country is thus clearly indicated. Owing to their comparative freedom from molestation in the spring, ducks and geese are said to linger and breed in many places where they had not bred for years previous to the passage of the Federal law.

One of the most important breeding areas for migratory game birds in North America is in the delta of the Athabaska River in Canada. Investigations were made by the Biological Survey during the summer of 1920 of the large marshy areas which here afford conditions favorable for the nesting of vast numbers of the waterfowl that migrate to the United

B845M

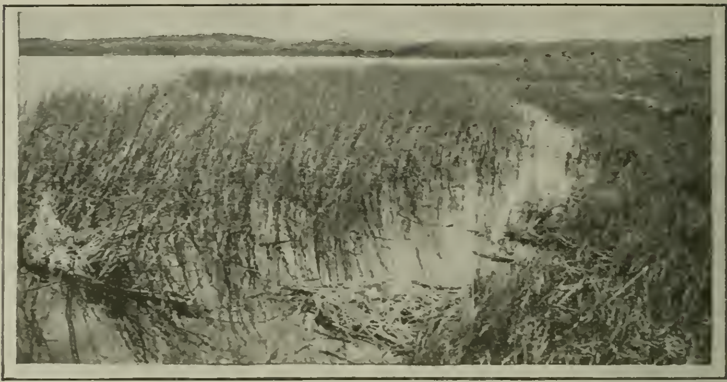
Swans and Canvasback Ducks.

Swans feeding under protection, without which their existence is threatened; Potomac River near Widewater, Virginia, March, 1916.

States or pass through to countries to the southward. This work resulted in the securing of much information required in the proper administration of the migratory-bird treaty act.

Since large numbers of our ducks and other migratory waterfowl pass the winter in countries south of the United States, some of the plovers and other shorebirds reaching as far as Argentina and Patagonia, it has been suggested that migratory-bird treaties similar to that with Great Britain be negotiated with various Latin-American countries. In Mexico migratory game birds are known to have been slaughtered for market on a large scale, but conditions in that country have not favored international measures for the protection of birds. The rapid agricultural development now taking place in southern South America may be expected to affect adversely our migratory birds during their sojourn in that region. To secure the information required preliminary to the suggested step, an assistant biologist of the Biological Survey was sent to Argentina and adjacent countries to observe the arrival of waterfowl during their southward migration in the summer of 1920 and to continue his studies of the conditions affecting these birds in various localities until they return northward in the spring of 1921. The data obtained will fill a great gap in our knowledge of the life histories of many migratory species and will suggest appropriate measures for their protection.

Aside from indiscriminate shooting, now fortunately checked under the treaty act, an important factor in the reduction in numbers of waterfowl has doubtless been the curtailment, through drainage, of valuable breeding grounds. With the more complete settlement of our country and the transformation of many marshy areas into farm lands, especially in the Western States and Canada, water birds are driven from their accustomed breeding places. These marsh lands, commonly adjoining small bodies of open water, also afford absolutely necessary resting places and feeding grounds for many migratory birds in general, and their preservation wherever possible has become a matter of prime importance. Many such areas are drained under the erroneous impression that their value is enhanced thereby, when as a matter of fact they could be made to yield a larger return if maintained during the open season as private or


B18890

Marsh Attractive to Wild Fowl.

Dead Dog Lake, North Dakota, typical of many areas throughout the United States which should be preserved as refuges for the breeding waterfowl and for the hosts of visiting migrants spring and fall. Nest and eggs of coot in the foreground.

public shooting and fishing grounds, and, where there is sufficient cover, for the production of such valuable fur-bearing animals as muskrats, beavers, minks, skunks, and raccoons. Beavers, through the building of houses and dams which tend to check erosion and to equalize the flow of streams, are active conservators of water. A natural ice supply may also be harvested from undrained marshes, and the underground water level may be more nearly stabilized, the latter an important consideration, especially in regions subject to long summer droughts.

Big-Game and Bird Reservations.

Appreciation of the value of big game and bird life as a public asset has resulted in the creation of many national wild-life reservations in charge of the Biological Survey. Four of those already established are big-game preserves, 70 are devoted to birds alone, and one is used for both big game and birds. In addition, the Survey is interested, in cooperation with the Forest Service, the National Park Service, State game commissions, and other organizations, in problems affecting game on the public domain.

The national bird reservations, distributed irregularly from Florida to Alaska and Hawaii, with warden service at some of the most important places, protect from molestation heron rookeries and the nesting sites of thousands of pelicans, gulls, terns, ducks, and other waterfowl. The heron rookeries include some of the principal remaining breeding places in the United States of the beautiful egret and the dainty snowy heron, both of which have been persecuted almost to the point of extinction for their nuptial plumes, formerly widely used in millinery under the name of aigrettes.

The big-game reservations administered by the Biological Survey in Montana, Wyoming, South Dakota, North Dakota, and Nebraska afford protection to limited numbers of buffalo, elk, antelope, and deer. Of these the most notable is the National Bison Range, at Moiese, Mont., where the buffalo herd now numbers about 335 head. This important remnant of the former great herds is exceeded in point of size

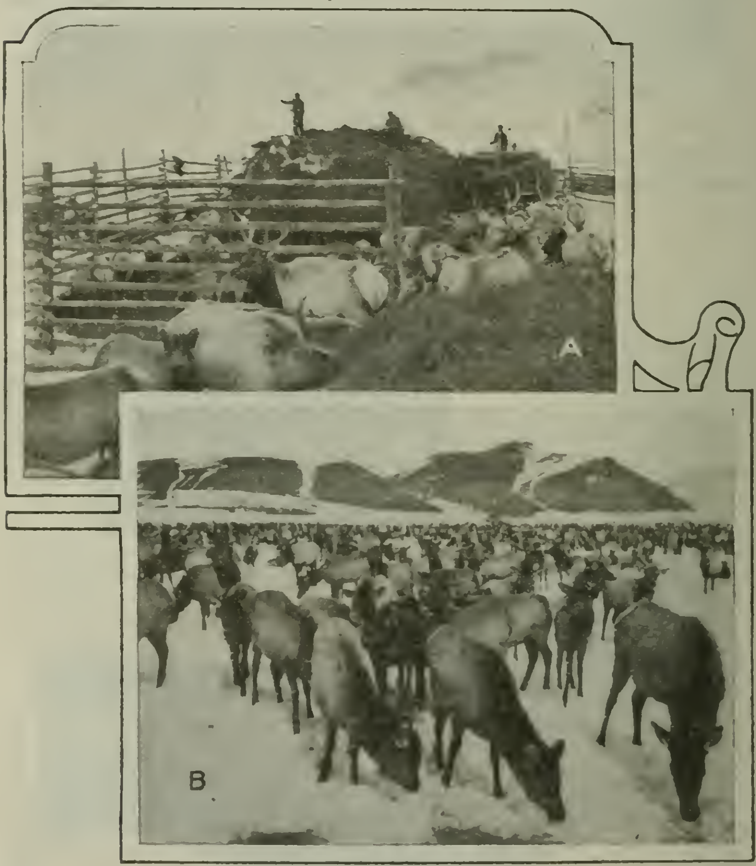
B14467; B12132

Buffalo on the National Bison Range.

A, Superb specimen of the former monarchs of the plains; *B*, part of the herd of 335 buffalo on their range in Montana, where they are protected by the Federal Government.

by only two others in the United States, the largest under Government control being the Yellowstone Park herd.

Perhaps the most interesting and important of the big-game reservations is the Winter Elk Refuge, in Jackson Hole, Wyo. The Jackson Hole region, a southern extension of the wonderland including the Yellowstone National Park, is traversed by the Snake River, which winds its way in graceful curves through a valley hemmed in by mountains,



B20609; B20594

Elk on Their Winter Refuge, Wyoming.

A, Feeding hay to elk during the severe winter of 1919–20, in Jackson Hole, Wyoming; *B*, part of the herd of 3,500 on the refuge in March, 1920. The winter care thus provided by the Government is preserving from otherwise sure extermination the remnant of the countless numbers of these, the most majestic of deer.

the serrated Teton Range towering like a wall on the western side. Upon the success attending the administration of this refuge largely depends the permanence of the so-called southern group of elk, now numbering about 12,000 head and comprising the largest section of the Wyoming, or Yellowstone, elk herd. Especial interest attaches to the elk of the Yellowstone Park region, as they constitute the only really large herds of big game remaining in the United States; and these are mere remnants of the former herds whose general range was measured by the full width of the continent, from Maine to California. Until recently a northern group, ranging in summer mainly within the Yellowstone National Park and migrating northward, was regarded as the larger, but it suffered greatly from the adverse conditions of the winter of 1919–20, and in all probability will never again attain its former numbers.

The elk comprising the southern group are widely scattered in summer at high elevations in the southern part of Yellowstone National Park and in the mountains of the Teton, Bridger, and Wyoming National Forests. With the first heavy snowfall in early winter they descend or migrate to lower levels, and formerly passed out into the open valleys, where the snow was light and forage abundant. With the coming of settlers, however, their winter range became more and more restricted. Many were killed, and the survivors have been forced to winter in the Snake River drainage, thousands congregating in the path of their former migration, in the vicinity of the winter refuge mentioned.

Following a prolonged summer drought which curtailed the growth of forage throughout the region, the winter of 1919–20 was unusually long and severe. In addition to the stock of hay on hand at the Winter Elk Refuge, the State of Wyoming provided about 500 tons of hay and a carload of cottonseed-oil cake. An emergency purchase of 573 tons of hay by the Biological Survey in January, because of conditions which it was foreseen would become desperate, prevented disaster to the herd. Several thousand elk frequently congregate on the feeding ground, where they crowd close about the wagons from which the hay is distributed, and the spectacle thus presented is one long to be remembered by the fortunate visitor to the place. The cottonseed-oil cake proved to be a particularly attractive ration, and the ordinarily shy, retiring animals quickly formed the habit of advancing with confidence to take pieces from the hands, and in some instances even from the lips, of those in attendance. Summer range and forage for elk are still plentiful, but additional lands adjoining the present winter refuge are urgently needed to furnish an adequate supply of winter feed and insure the permanence of the largest remaining herd of these splendid game animals, the most majestic of all deer.

B20600

Elk "Asking for" Cottonseed-Oil Cake.

Crowding eagerly about the sled these normally wild animals readily take cottonseed cake from the hands. Their too close approach has somewhat alarmed the young lady assisting in the feeding. Leek Ranch, near Jackson Hole, Wyoming, March, 1920.

In addition to the conservation of existing big game, the restocking of certain areas over which game has disappeared is a measure of obvious importance. Mountain sheep, especially, should be restored to many rugged mountainous areas where they have recently become extinct. What may be accomplished in this line is exemplified by the recent introduction on the Sitgreaves National Forest, in Arizona, of elk from the Yellowstone. Native elk went the way of the buffalo and became extinct in Arizona more than 30 years ago.

As a result of the transplanting of 80 animals in 1913 through the cooperation of several Elk lodges, the Biological Survey, the Forest Service, and the National Park Service, the elk now on the forest are estimated to number between 400 and 500 head. Owing to the general absence of agricultural interests with which elk are apt to conflict, this former range is admirably adapted for restocking with elk. A proposed refuge to be established before any hunting is permitted is now under consideration. Under

B900M

Mountain Sheep Feeding.

Natural haunts in Yellowstone National Park. These splendid game animals are now extinct in many mountainous areas which should be restocked. (From photograph by M. P. Skinner.)

proper administration the elk may be expected to spread gradually to adjoining parts of the Mogollon Plateau and become a splendid addition to the game resources of the State and Nation.

Big Game and Fur Bearers of Alaska.

Conditions are more primitive in the Territory of Alaska, where the Biological Survey has within the year been charged with important and pressing problems, including consideration of the future of the great caribou herds. These animals, numbering tens of thousands, are preyed upon by the packs of wolves which follow them in their annual migrations, and the advent of man has become a very serious factor in their diminution. A most promising line of activity associated with the caribou is the promotion of the reindeer industry. It is believed that by crossing the reindeer with the larger native caribou a superior and yet tractable breed may be secured. Reindeer, the domesticated Siberian caribou, were first introduced into Alaska in 1892, and, fostered by the Bureau of Education, thriving herds have been built up and now aggregate about 200,000 head. These animals give promise of going far to make up any future shortage in our meat supply, and their management will result in the utilization of millions of acres of northern

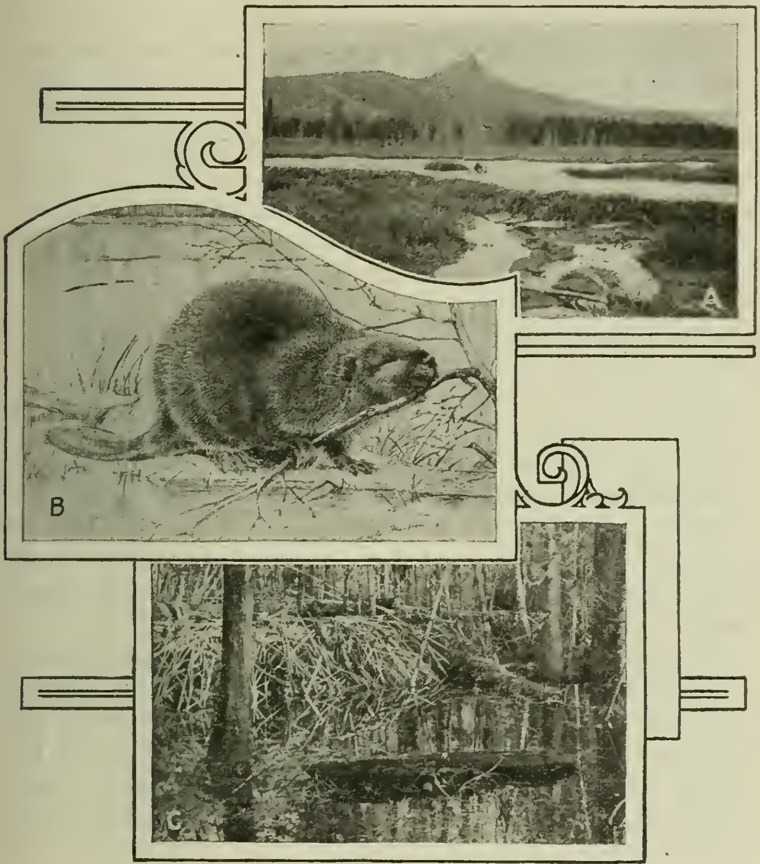
B20510

Alaskan Reindeer Herd.

Reindeer were first introduced from Siberia in 1892 to provide food and transportation for the natives of Alaska. The thriving herds now promise to supplement the meat supply not only of Alaska but of the States as well. (Photograph by Lomen Brothers.)

lands largely overgrown with a lichen known as reindeer moss, one of the principal plants naturally fed upon by these animals, especially in winter. Investigations that will lead to improved grazing administration and herd management are now in progress.

Other Alaskan game animals now engaging the attention of conservationists are the native deer and the big bears. The deer of southeastern Alaska have been indiscriminately killed by natives and are now threatened with extinction, but it is hoped that measures may be taken to save them.



The Beaver and Its Conservation Work.

A, Beaver dam, pond, and "house" on branch of Mountain Creek, Yellowstone National Park; *B*, beaver, from drawing by Ernest Thompson Seton; *C*, close-up view of beaver dam, on Horse Creek, Rainier National Forest, Washington. The beaver is a conservator of water. The dam is built in order to maintain submerged entrances to the house, the interior of which is above the water level.

The great brown bears of Alaska, some of the largest in the world, are classed as game animals, but owing chiefly to their aggressiveness opinions differ as to whether they should be afforded any protection.

The conservation of land fur-bearing animals is, if possible, more difficult than that of most game. Fur bearers of Alaska, particularly foxes and martens, have been seriously depleted in numbers during the past few seasons, owing to the apparent periodical scarcity of certain of the birds and the rabbits upon which these animals normally feed, and to the fact that high prices paid for fur have greatly stimulated trapping activities. The former circumstance affords another example of the complicated relationships existing in nature. Plans for the better protection of fur-bearing animals are being formulated and executed, and less persistent trapping due to falling prices for the fur is favoring the increase of fur bearers in Alaska. Fur farming, particularly fox farming, seems destined to become an important industry in Alaska as well as in the various States. The conservation of land fur-bearing animals, upon which a trade representing many millions of dollars is based, is receiving the especial attention of the Biological Survey, with the object of fostering the rearing of these animals in semidomestication or under partially controlled conditions. Experiments and practical studies, some in Alaska, but most of them in the States, have been initiated regarding foxes, fishers, martens, minks, skunks, raccoons, beavers, and muskrats.

The conservation of wild animal life, intimately bound up with the conservation of natural resources in general, has become a necessity. The alternative would transform our country into a land as barren of natural interest as some of the waste parts of the Old World and stripped of material assets which should contribute immeasurably to our wealth, comfort, and well-being.

PIG PARASITES AND THUMPS

By B. H. Ransom,
Chief, Zoological Division, Bureau of Animal Industry.

A TEN DAY TOUR through the body, from the intestine to the lungs and back again, is the strange trip taken during its early life by the common intestinal roundworm of the pig. The recent discovery of this habit of the young parasite has led to another interesting discovery, that if many of the worms go on their travels at the same time, the result to the animal whose lungs are thus invaded is often disastrous. The roundworm in question, which bears the name of *Ascaris lumbricoides*, is one of the most injurious parasites of pigs and has long been recognized by swine breeders as a troublesome pest, causing digestive troubles, interfering with growth, and impairing health, especially in young animals. It is also of common occurrence in human beings, particularly children.

Eggs Hard to Spoil.

The adult worms (fig. 1, *A*) live in the small intestine. The female, measuring when full grown a foot or more in length, produces millions of eggs of microscopic size, which pass out of the body of the infested pig or human being in the intestinal excreta. These eggs are provided with thick, impermeable shells and are endowed with remarkable vitality, so that they can withstand severe cold, dryness, and most chemical disinfectants. They have been known to remain alive as long as five years.

When the eggs reach the outer world they are in an early stage of development and are not infectious if taken

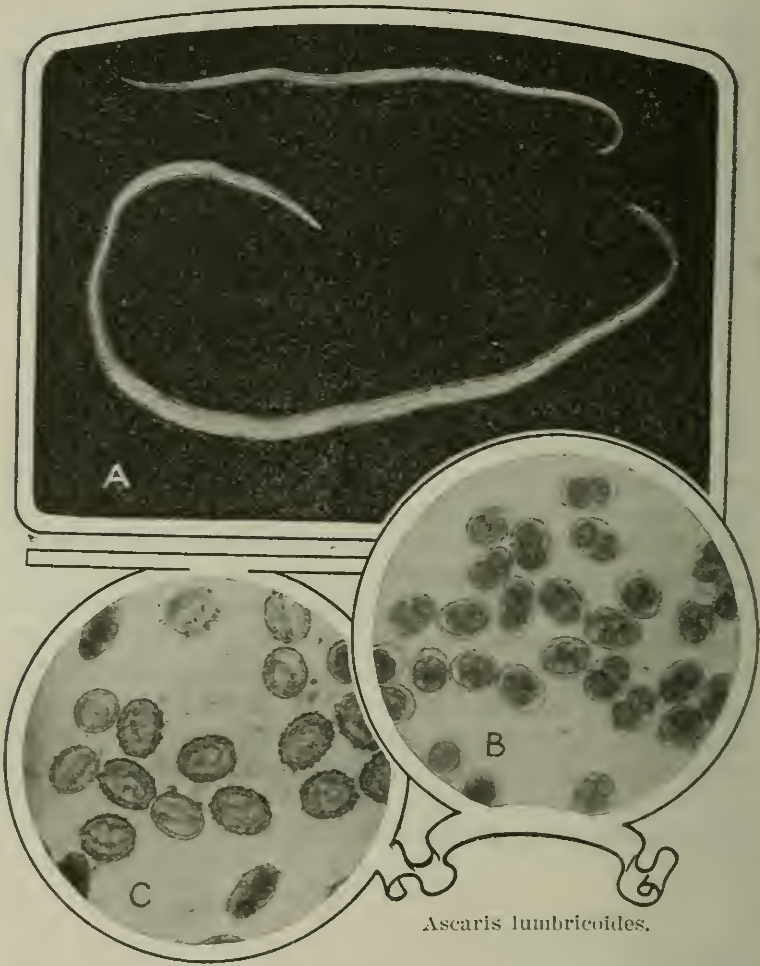
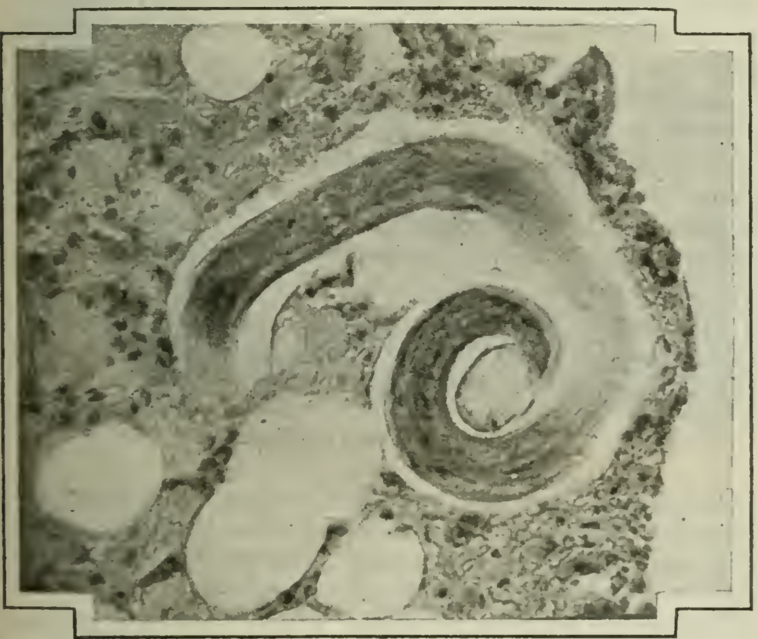


FIG. 1.—*A*, Adult intestinal worms of the pig. Larger one, female; smaller one, male. About one-half natural size. *B*, Eggs in early stages of development. Magnified 150 times. C, Eggs containing embryonic worms. Magnified 150 times.

into the body of a pig or a human being (fig. 1, *B*). In a few weeks, however, if temperature and moisture conditions are favorable, a tiny worm develops within the eggshell, and the egg becomes infectious (fig. 1, *C*). If the egg should then be swallowed it hatches after reaching the small intestine, and the young worm is ready for its 10-day journey.

Taking a Trip and Growing.

Formerly it was supposed that the worm after hatching simply settled down in the intestine and continued its development, but as a result of recent investigations by Lieut. Col. Stewart, of the Indian Medical Service, by Prof. Yoshida, of Osaka University, Japan, and by Mr. Foster and the writer, of the Bureau of Animal Industry, it is now known that the young parasite makes a circular tour—a sort of home-seeker's trip—through the body of the pig. After hatching, the young worm, which at this time measures less than one one-hundredth of an inch in length, promptly leaves the intestine, gets into the blood vessels, and is carried first to the liver and then to the lungs (fig. 2), passing through the heart on the way. In the lungs it spends a number of days, but soon passes up the windpipe into the pharynx and then down the esophagus or gullet into the stomach and at last into the small intestine. This journey



The Parasite in a Lung.

FIG. 2.—Young intestinal worm in lung one week after infection. Highly magnified.

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from the intestine to the lungs and again into the intestine usually requires about 10 days. Meanwhile the worm has grown considerably, and when it leaves the lungs and returns to the intestine it is nearly ten times as long as when it first hatched, although it is still too small to be seen without a microscope, and has yet to undergo an enormous growth before it is fully developed. It reaches maturity in about two and one-half months, including the time spent on its journey to the lungs and back again into the intestine.

"Thumps."

In passing through the lungs the young worms cause small hemorrhages, and if numerous they give rise to pneumonia, which may prove fatal. Moreover, it has been observed that pigs which survive the stage of lung infection often fail to grow and develop properly, and remain small, stunted, and unprofitable (fig. 3). The symptoms shown by pigs whose lungs have been invaded by these worms are commonly known as "thumps." There are other causes of "thumps," which is a term loosely applied to almost any condition in pigs in which there is difficult breathing, but invasion of the lungs by young intestinal roundworms is one of the most frequent causes. Similar disturbances of respiration occur in human beings in the early stage of roundworm infection, and it is probable that some of the obscure lung troubles of children will be found to have the same basis as parasitic "thumps" in pigs.

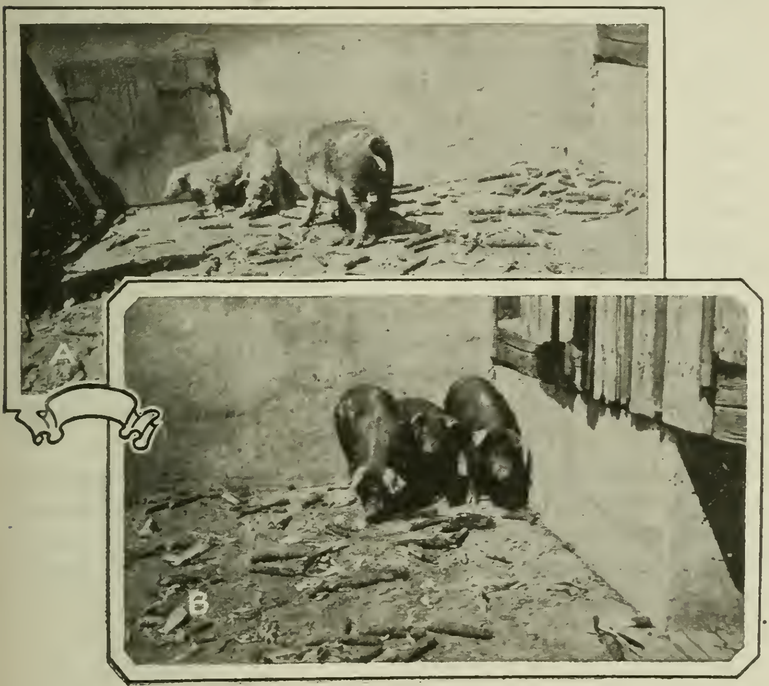
Pigs as they become older become more resistant to infection by the intestinal roundworm and also are less likely to suffer seriously from the lung stage of the parasite.

How to Prevent Losses.

The newly discovered facts that have been mentioned not only show that the common intestinal roundworm is a more dangerous parasite than formerly supposed, but also help to show how the damage it does may be avoided.

Because of its great prevalence among hogs, and because its eggs in hog yards and pastures are so long-lived, complete eradication of the parasite is a difficult matter and not likely to be accomplished on most farms. It is readily possible, however, to manage in such a way as to eliminate the serious losses that often occur as a result of *Ascaris* infection. In short, the problem resolves itself largely into that of proper protection to young pigs until they have reached an age at which they are no longer likely to suffer serious injury even though they become infected.

Accordingly, clean and sanitary farrowing pens should be provided, into which the sows are placed a few days before farrowing. Mud and dirt from long-used hog yards and wallows, likely to be heavily laden with infectious *Ascaris*



Growth Is Stunted by Parasites.

FIG. 3.—*A*, Three pigs about 4 months old from the same herd. The two small pigs, weighing 12 and 15 pounds each, show the effects of severe *Ascaris* infestation. The large pig, which has escaped serious injury by *Ascaris*, weighs 90 pounds. *B*, Three pigs from the same litter, about 4 months old. When a few weeks old the small pig in the middle was artificially infected with *Ascaris* eggs, as a result of which it passed through an attack of thumps. Originally of about the same weight as either of the other two, this pig, though kept with the others on the same feed, failed to grow as well. At the time the picture was taken the small pig weighed 45 pounds and the large pigs 100 pounds each.

eggs, should be cleaned from the skin, especially from the udder, before the sows enter the farrowing pens.

From the farrowing pens the sows and pigs are transferred to fields or pastures that are as free as possible from infection, and until the pigs are about 3 months old they are rigidly excluded from permanent hog yards and pastures and other places likely to be badly contaminated with the droppings of hogs.

Essentially the plan consists in providing a clean place for farrowing and in excluding young pigs from polluted pens and pastures. It has been tried with excellent results on a number of farms in the Middle West. On some of them, where formerly a considerable percentage of the pig crop was lost, there have been practically no losses since this simple plan of sanitation was adopted. From the experience gained in the practical tests that have been made of improving the sanitary conditions under which pigs are reared, based upon our newer knowledge of the intestinal roundworm, it is evident that with comparatively little effort, understandingly applied, on the part of the swine raisers, tremendous savings can be made in the pork production of the Nation, and added security given to an industry from which already much of the hazard has been removed by the application of the results of investigation of other swine diseases.

Thus, in this instance, as in many others, scientific research has pointed the way toward the elimination of destructive waste from disease among live stock as well as among human beings, and has again demonstrated its importance as a factor in agricultural progress.

SPEAKING OF THE WEATHER

By J. Warren Smith,
Meteorologist, Weather Bureau.

"Well, Duncombe, how will be the Weather?"
"Sir, it looks cloudy altogether,
And coming across our Houghton Green,
I stopped and talked with old Frank Beane.
While we stood there, sir, old Jan Swain
Went by and said he knowed ''twould rain';
The next that came was Master Hunt,
And he declared he knew it wouldn't.
And then I met with Farmer Blow;
He plainly said he didn't know—
So, sir, when doctors disagree,
Who's to decide it, you or me?"

IS THERE any place in this country where the first and often the chief subject of conversation wherever neighbors meet is not the weather? Perhaps in those regions where the sun shines during most days, and where rain seldom falls; but assuredly not where the change from fair to foul is frequent and where the mercury has to run far up and down the glass to keep up with the changes of temperature.

With farmers the topic is a favorite one, and the reason is plain and practical. An extra quarter of an inch of rain at the right time may add thousands of bushels to the corn planter's harvest; a few degrees lower temperature may put a lot of extra money into the potato grower's pocket. The way the wind blows is sometimes more important than the cost of farm labor. Crop yields are controlled by the amount of sunshine, rainfall, and heat received, and all farm operations are fostered or hindered by the prevailing weather.

The weather is a source of anxiety from the time of preparation of the soil for seed until the last harvest is gathered. And even then the producer's worry is not over, because the weather may hinder the movement of his wagon or truck to the freight station, or of the train or boat or truck fleet to the large centers of distribution.

When the meteorological work of the Army Signal Corps was transferred to the Weather Bureau, Department of Agriculture, on July 1, 1891, the duties of the service were designated "for the benefit of agriculture, commerce, and navigation." As such a large percentage of commerce and navigation consists of products from farms and orchards, the agriculturist is vitally interested in all phases of the work of the Weather Bureau.

The Weather Twice a Day.

Every morning and evening at 8 o'clock (75th meridian time) work speeds up at 200 different weather stations in the United States as observations are made of the wind and weather, air pressure and temperature, clouds, humidity, and rainfall during the preceding 12 hours. Within 5 minutes after these observations are made, a telegraph message, in code, giving all the essential weather facts, is filed at each local telegraph office, and by an ingenious "circuit" system, is transmitted within 30 minutes after the instruments are read to the central office at Washington and to about 180 other important Weather Bureau offices in various parts of the country.

Trained men take these telegrams as fast as they come into the district forecaster's office and chart the information they contain on outline maps of the United States, so that by the time the last message is received the forecaster has a complete picture of the weather as recorded at practically the same moment over the entire United States. In addition, reports are received from stations in the West Indies, northern South America, Central America, Canada, Alaska, Bermuda, the Azores, and from a few places in Europe and Asia. No other country covers so wide a territory in the daily information spread before the weather forecaster. With this information and with the maps made 12, 24, 36, and

DID the weather man "hit it" to-day? Well, maybe not to-day, but did you know that the daily forecasts are 88.4 per cent accurate?

And that no big storms have occurred along the coasts and Great Lakes for years without warnings 12 to 24 hours in advance?

How are the roads to market to-day, muddy, snow-filled, frozen, washouts, or good?

Is the temperature down the line safe for shipping produce to-day?

Will next week be good haying weather?

Will the orchard heaters be needed to-night?

How high is the river to-day?

Will it be safe to spray to-morrow?

I want to cut my seed crop to-morrow: How 'bout it, Mr. Weather Man?

The Weather Bureau has the answer. Its forecasts are scientific—not superstitions or guess-work.

This article tells how the Weather Bureau serves you right.

48 hours before, the forecaster can trace the movements of storms, cold or hot waves, fair weather areas, and the like, as they move across the country.

Twice-daily weather forecasts are made by the district forecasters at Washington, Chicago, Denver, New Orleans, and San Francisco for each State in the groups of States surrounding their stations. The morning forecasts are made at about 9 a. m. (eastern time), and cover the probable conditions for the next 36 hours. These forecasts are promptly telegraphed to about 1,600 distributing points, whence they are further disseminated by telegraph, telephone, wireless, and mail. They reach nearly 100,000 addresses by mail, and are available to more than 5,500,000 telephone subscribers within one hour after the time of issue. These are the forecasts that are published in the afternoon newspapers, and they aid a multitude of people to prepare for favorable or unfavorable weather during the coming night and following day.

Many thousands of persons never think of starting out on a trip, or of taking up any important work, without first consulting the daily weather forecast. Shippers of perishable products in most of our important cities delay their daily shipments until they know from the forecast what temperature to expect, and can judge how to prepare their goods for it. High temperatures are detrimental to certain commodities, and low temperatures may harm or destroy others. During the harvesting season, especially, a large number of farmers use these forecasts in planning their work for the afternoon or next day.

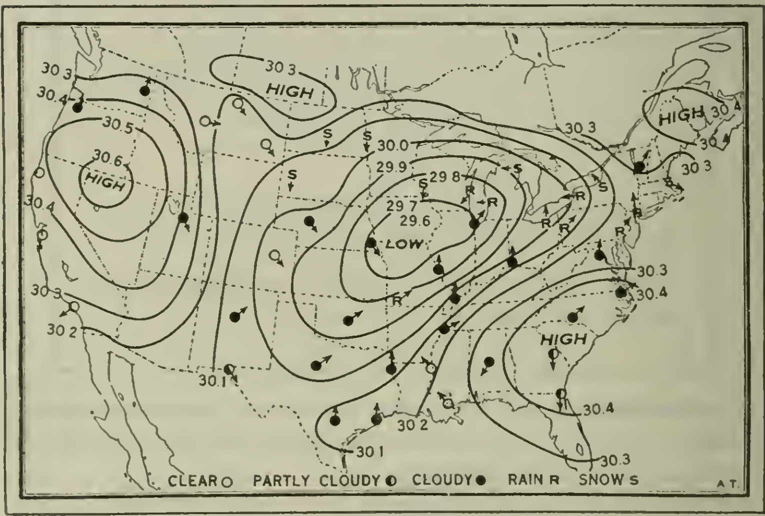


FIG. 1.—A typical winter storm central over southern Iowa, December 15, 1893. The lines pass through points of equal pressure. The arrows fly with the wind and show that it blows spirally inward toward areas of low pressure, and outward from areas of high pressure.

Figures 1 and 2 show typical weather maps for two successive days and illustrate the usual movement of weather changes toward the East in this latitude. The twice-daily maps are the basis of all weather forecasts. Evening forecasts are made at about 9 p. m., covering the next two days, and are published in the morning papers throughout the country.

Will It Be Fair and Warm Next Week?

Is it going to be cool and rainy next week or warm and dry? Or will it be a period of showers and sunshine? Such questions and kindred ones are often in the mind of the farmer as he plans his work for the week ahead during the growing season. He is concerned with the general state of the weather in this case rather than what will happen in the next 36 hours. For instance, will it be a particularly favorable time to cultivate certain crops? The right answer may mean both easier and better cultivation and in turn more money in the farm pocketbook.

Forecasts are made each Saturday for the six days beginning the following Monday. They are made for nine sepa-

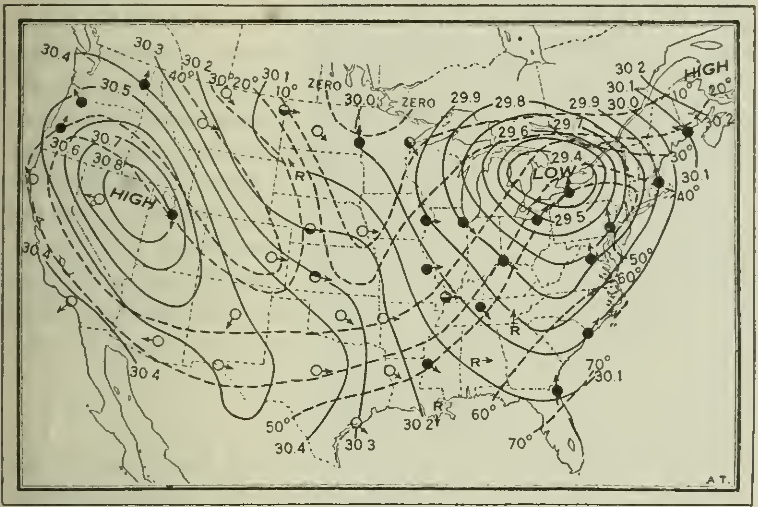


Fig. 2.—Twenty-four hours later than figure 1, December 16, 1893. The storm center has moved to the lower Lake region. The dotted temperature lines are shown on this map and indicate the influence of wind direction on the temperature.

rate districts and, necessarily, are couched in general terms. They are immediately telegraphed to certain designated centers, where they are further disseminated by telegraph, telephone, mail, and through the press.

Flying Weather.

For many years the daily weather forecasts have been made for activities on the surface of the land and for the benefit of those who travel the surface of the waters. The recent phenomenal development of the navigation of the air now makes it imperative that the condition and movement of the atmosphere above the land and water be anticipated; so the Weather Bureau issues twice-daily forecasts of "flying" weather for 13 aviation zones in the United States. These give visibility, kind and height of clouds, wind at various elevations, and other information to help the aeronaut lay his course and choose his altitude.

Observations on which forecasts of upper-air conditions are based are made twice daily at 25 pilot-balloon stations, and once daily at 6 kite stations. The reports from pilot-balloon observations show the wind direction and velocity, not only at the surface of the ground but at 250, 500, 1,000, 1,500, 2,000, 3,000, and 4,000 meters above the surface. They also give the height and movement of clouds. The kite stations show pressure, humidity, and temperature at various elevations, in addition to wind direction and velocity. Occasionally observations show a wind at a moderate elevation blowing in exactly the opposite direction from that near the surface. The aerial mail going from New York to Chicago, for example, may find a favorable wind from the east at 500 meters elevation, while at the same time the mail from Chicago to New York may find a high west wind at 1,500 meters.

Fire Weather.

Another comparatively new feature of the work of the Weather Bureau is the forecasting of conditions favorable for the inception and spread of forest fires, so that forest officers may make plans ahead for a hard fight against this enemy of the forest.

Keeping Ahead of the Frost.

One cold night is sometimes enough to ruin a crop of fruit worth thousands of dollars. In such a case the orchardist is not content in these days to fold his hands and let the weather have its way. He recognizes, to be sure, that one can not warm up all outdoors; but it is possible to warm up a considerable slice of outdoors, enough to save his fruit, and so he invests in heaters and relies on the Weather Bureau to tell him when to stoke up. The protection of fruit, truck, tobacco, and alfalfa seed from late spring or early fall frosts is receiving more and more attention and the Weather Bureau is doing its part in regions where the endeavor is made to protect crops from cold by issuing detailed and definite frost warnings and minimum temperature forecasts.

The protection of citrus fruits against winter cold is necessary and highly profitable in most sections where these crops are grown. The annual fruit crop in the Pomona district of southern California is valued at fully $17,000,000, and the saving in one year by orchard heating may be not less than $1,000,000. In one 40-acre orange grove at Claremont, Calif., there was an estimated loss by low temperature of $10,000 worth of fruit in the two seasons prior to 1913, and $25,000 worth of fruit in 1913. In addition, so many of the trees were so severely damaged that they bore greatly reduced crops during the next several years. The orchard was fully equipped with oil heaters in November and December, 1913, at a total expense of $3,067, and the loss by frost since that time, including the severe season of 1918–19, has been negligible. The average annual cost for heating per acre for the four years following installation, including the interest on the investment, was $26.56, or only 4 per cent of the loss sustained in the year previous to the installation of the heaters.

FIG. 3.—Tall-stack, down-draft oil heaters in a citrus orchard. These burn with very little smoke. The lower part of the stack becomes red hot when in operation.

The cost of protection on a 220-acre lemon orchard in southern California for the six years from 1913 to 1918, inclusive, was $13.15 per acre. This included labor, oil, depreciation, and interest on the equipment. The lemon crop from this grove in 1913, a season when the citrus crop in many parts of southern California was practically a total loss and thousands of trees were killed outright, brought $734,318 f. o. b. California, or an average of $3,338 per acre. If the heating was instrumental in saving only one-fourth of the crop in 1913, this saving would pay the entire expense of heating for over 60 years.

FIG. 4.—The California Oil Heater in an Orange Grove.

The value of the citrus crop in California for the year ending August 31, 1920, is estimated to be $81,200,000. There are few sections of the State not subject to frost damage some time during most winters; hence, forecasts of damaging temperatures are of vital importance to its fruit industry.

The Weather Bureau has had a special representative in the Pomona district for several winters to study the temperature distribution, air drainage, other weather conditions, and the results of heating, so that more detailed and exact minimum temperature forecasts could be made. This official has performed similar duties in the deciduous orchards in the Rogue River Valley in Oregon, with results shown in the following quotation from a letter from Medford: "This work has saved our fruit growers literally hundreds of thousands of dollars worth of fruit."

Cold Waves and Heavy Snow.

Warnings of sudden and destructive falls in temperature are issued from 24 to 48 hours in advance of the drop in temperature, and the information is widely disseminated by telegraph, telephone, mail, and flag display. The warnings

A Popular Type of Oil Orchard Heater in Operation.
FIG. 5.—The burning surface can be regulated by the sliding cover. About 100 to the acre should be used on severe nights.

issued for a single cold wave of exceptional severity and extent resulted in saving over $3,500,000 through the protection of property from injury or destruction.

When cold-wave warnings are issued, transportation companies protect goods in transit; florists and warehouse and greenhouse men take necessary precautions; water pipes are protected in towns and cities; cement work is delayed or cared for, and winter truck and citrus fruits are protected.

Heavy snow warnings aid railroad, interurban, and city officials to take extra precaution to keep the interruption of traffic at a minimum; stock are kept near shelter and the feeding sheds; extra effort is made in advance to keep motor-truck roads open; and all outside work is governed accordingly. Large hardware firms take steps to ascertain whether the distributing houses have a sufficient stock of snow shovels, and the like, on hand.

Blizzards on the Ranges.

The stock growers over the great range States of the West are vitally interested in cold waves, heavy snows, high winds, and storms locally known as "blizzards." The Weather Bureau recognizes this and issues warnings of these unfavorable conditions for stock. These warnings are widely distributed by telegraph and telephone to large centers, but the further dissemination must devolve on the people interested. The problem has been largely solved in the State of Missouri by telegraphing the warnings to one central point in each county, at which place arrangements are made to telephone information of the warnings to each community interested. When a warning is received the cattle or sheep men on the great western ranges arrange to graze their stock near shelter, or in such a direction from shelter that the stock will drift toward it when the anticipated wind comes.

A modification of this service is the sheep-shearing and lambing forecasts and warnings. In early shearing and lambing districts shearing is delayed, or newly shorn sheep and ewes with young lambs are kept near suitable shelter, such as coulees, where they will receive protection from the wind when cold rains are expected.

Fruit Pests and Rainy Weather.

The value of the western New York apple crop averages about $12,000,000 a year, and the value of other fruit in the district is $6,000,000. The importance of protection from insect and fungous diseases in this district by spraying is well shown by the results of one test case, where by spraying at the proper time the value of the crop was increased $126 per acre, while the expense of spraying was only $6.77 per acre. It is estimated that $500,000 are spent in spraying each year, with a resulting increase in the value of the fruit of $6,000,000.

It has been found that to protect against apple-scab, as well as other fungous diseases, the spray must be applied before a spell of rainy weather. Because of the size of many of the orchards, it takes from two to three days to apply the spray. Spray specialists were called in to advise the orchardists when to apply the different sprays, and they, in turn, called on the Weather Bureau for forecasts of spells of rainy weather far enough in advance to apply the spray during the fair weather intervening. As the regular daily weather forecasts are made for only 36 to 48 hours in advance, it became necessary for the bureau to inaugurate a special forecast service for fruit spraying. In 1919 a special representative of the bureau was located at Rochester, N. Y., near the center of the fruit-growing district. This official kept in touch with the advance of the season and conferred with the spray specialists, while the special weather forecasts were made by the district forecaster at Washington, D. C. As funds were not available for the detail of a special representative of the bureau in 1920, the duties were assigned to the official in charge of the Weather Bureau office at Rochester, to whom the forecasts were telegraphed each evening. The spraying specialists located in Rochester conferred with this official on receipt of the forecasts, and whenever rain was forecast instructions were given to start spraying. A complete system for the immediate distribution of these warnings was inaugurated, so that practically every fruit grower in six or seven counties received them early the next morning, and could at once start his campaign against fruit diseases. The plan was so successful that it was carried into the Hudson Valley fruit district of New York, and into lower Michigan, in 1920.

The fruit growers of the Yakima Valley of Washington, where damage by codling moth amounted to $2,000,000 in 1918, and other fruit growers, are asking for a similar service. This is a new demand on the Weather Bureau which will be met as fast as the appropriations allow.

River and Flood Warnings.

The flood-warning system of the Weather Bureau is of long standing in the large river valleys and it is not unusual to predict river heights in the lower Mississippi Valley to within a few tenths of a foot several weeks in advance. The flood warnings may be only a few days or hours in advance in some of the smaller valleys, but these allow for the driving out of stock, the protection of merchandise, or the moving of people to places of safety.

During the unprecedented flood in Ohio in March, 1913, the wires went down so quickly after the excessive rains started that warnings could be given little distribution in the western portion of the State, and many lives were lost in Dayton, Hamilton, Columbus, Delaware, and other cities. A warning reached the Muskingum Valley, however, in the eastern portion of the State, and only two lives were lost at Zanesville, where the river was over 15 feet higher than ever before known: no lives were lost in the valley south of that city.

Alfalfa Harvest Forecasts and Seed Warnings.

Forecasts of weather favorable for alfalfa harvest are widely distributed in the West, particularly in Oklahoma, where 2,000 or more growers receive the forecasts through the

FIG. 6.—The Flooding of Agricultural Territory During Periods of High Water.

local agents of the Extension Service. A much more extensive distribution of this information is possible in many districts.

A rather limited, but important, frost-warning service for alfalfa-seed growers is in operation in Utah. Seed is largely grown from the second crop, and if the season is late the harvest and fall frost periods come close together. As the seed crop increases in value at the rate of about $5 a day for each acre of seed when nearing maturity, the growers let the seed stand as long as possible. When temperatures low enough to cause damage are predicted by the Weather Bureau, it is not unusual for the seed growers to run their cutting machines most of the night.

In two sections of Millard County, Utah, in the fall of 1918, fully 500 acres of seed were cut after receipt of the warnings, at an average saving of $20 to $30 per acre. Reports from two growers stated that they had saved not less than $2,000 by information furnished by the Weather Bureau as to frost.

Sugar-Cane Harvest.

A similar condition obtains in the lower Mississippi Valley. The sugar content of the cane increases rapidly in the late fall, and cane is left standing until warnings of damaging temperatures are received; then every available man is set to windrowing cane, and hundreds of thousands of dollars worth of cane may be cut in the 24 hours following the receipt of a cold-wave warning.

Rain and Raisin Drying.

In the great raisin-grape growing district in central California, the drying is done in trays in the open air. Great loss would result if rain should fall on the partially dried fruit; hence when rain is expected the information is immediately spread throughout the valley by telephone and telegraph, and every available person is set to stacking the trays. The schools may be closed and the children be pressed into service, and woe betide the unfortunate hobo caught in the district who has a disinclination to get acquainted with work.

Mountain Snowfall.

Mountain snowfall stations are maintained in the western mountains in cooperation with the Forest Service, and make it possible to show the accumulation of snow for spring and summer irrigation in the agricultural valleys.

Storm and Hurricane Warnings.

Scores of other instances might be mentioned of the use made of the regular and special forecasts and warnings issued by the Weather Bureau, that show the far-reaching value of this information that so many people have come to take as a matter of course.

The warnings of storms and hurricanes along the coast must not be overlooked, however, as this service is probably the most important from a money and life-saving point of view in operation by any Government bureau.

Storm warnings are displayed in every port and harbor of any considerable importance along the Atlantic, Pacific, and Gulf coasts, as well as along the shores of the Great Lakes. This warning service is so nearly perfect that scarcely a storm of marked intensity has occurred for years for which ample warning has not been given from 12 to 24 hours in advance.

The sailings of the immense number of vessels engaged in our ocean and lake traffic are largely determined by these warnings, and those displayed for a single hurricane are known to have detained in port on our Atlantic coast vessels valued, with their cargoes, at over $30,000,000.

An increased number of reports from West Indian stations and from ocean craft of all kinds, and the hoped-for inauguration of a number of aerological stations in the Tropics, will make it possible to follow the tracks of the terrible tropical hurricanes more closely, and determine further in advance just where they will strike the coast line.

Special Reports for Cotton and Cereal Regions.

In addition to the weather maps, and forecasts and warnings, the Weather Bureau maintains a daily reporting service, especially in the interests of agriculture.

Reports of the rainfall and highest and lowest temperatures during the preceding 24 hours are telegraphed each morning during the growing season from 187 special stations in the 16 principal grain States. Daily bulletins, giving the data in detail in the immediate district, and a general summary of the weather over the whole area, are published at 19 different points.

This service is maintained for the benefit of those interested in the cereal crops in the United States and gives each day accurate information as to prevailing weather throughout the sections where these crops are principally grown.

A similar service is maintained in the interest of the cotton growers in the South. Reports are received each morning from about 200 different points in the 11 principal cotton States, and daily bulletins are issued at 26 central points. These give exact information of the temperature and rainfall in all parts of the cotton belt during the preceding 24 hours.

Highways Weather Service.

In the winter of 1917–18, when the war made necessary the inauguration of extensive motor truck lines, the Weather Bureau began reports of snowfall, and snow probability, along the Lincoln Highway east of Pittsburgh. This was found so valuable that requests came from other districts, not alone for reports in winter but in the summer as well; hence, what was expected to be a winter service over limited areas has developed into an important all-the-year service over a large part of the country. Prompt information as to the effect of rain on the great highways, in the Middle West especially, is of the greatest value to automobilists and motor truck operators, but of no less value to the farmer who wishes to get his crops to market. A lack of available funds has made it impossible to extend this very popular highways service as rapidly as desired, although bulletins are being issued at about 50 stations in 30 States.

Weekly Weather and Crop Reports.

A report is published each Wednesday at New Orleans, La., which shows the weather during the preceding week, in detail, and its effect on crops and farm operations in the South. A similar bulletin is issued at Chicago covering the principal grain-growing States. At the same time bulletins are published in each State covering the weather and its effect in that State.

The National Weather and Crop Bulletin is published at the Central Office, covering the whole United States. It shows the temperature, rainfall, and sunshine, by means of charts, during the week ending Tuesday, and their effect on all the principal crops in every part of the country. By following these reports from week to week, it is easy to see when the weather has been favorable or unfavorable for crop development or farm work.

Similar bulletins in the great grazing districts of the West show whether ranges are snow-covered, where the rainfall has been ample, or deficient, and whether the ranges are in good or poor condition.

Studying the Air and Sunlight.

No sciences make real progress unless research is carried along with routine work. The science of meteorology needs to develop several lines of research to make its work of the most value to agriculture, navigation, and commerce.

Soon we must add to our knowledge of the physics and dynamics of the upper air to aid in making aviation forecasts, as well as to improve the regular daily forecasts for other interests. Some of the aerological stations use kites that carry meteorological instruments to heights of from 1 to 3 miles usually, although, in a few cases, an altitude of over 4 miles has been attained.

Rubber pilot-balloons are used to determine wind direction and velocity at moderate elevations above the earth. When observations of pressure, temperature, and moisture, in addition to wind, at very great heights are desired, however, they are made by sounding balloons, carrying light meteorological instruments. It is not uncommon for these balloons to reach heights well above 10 miles, and they have gone slightly higher than 20 miles above the surface of the earth.

It is known that the temperature falls fairly steadily to 70° or 80° F. below zero at about 8 miles, while at greater heights there is very little variation in temperature; that the pressure at 20 miles is only about one-sixteenth of what it is at the surface of the ocean, and that the wind velocity is sometimes 100 to 200 miles per hour at no very great elevation; one record of 185 miles was recently observed at slightly above 4 miles.

This is a line of investigation demanding no great expenditure of money, but very promising in results. A complete knowledge of shifting and variable great air currents, the differences in the moisture content of the upper air, and the variations in temperature promises to aid materially in aviation and daily weather forecasts.

All life on our earth, and likewise all weather changes, are dependent on energy received from the sun. The rate at which this energy is received varies with geographical position, with the season of the year, and from day to day, with the state of the atmosphere. In other words, the intensity of sunshine, as well as its duration, varies with geographical position, and from day to day.

The most noticeable effects of the variations in solar radiation are the zonal and seasonal variations in air temperature and in vegetation; and these latter are closely associated with human existence and comfort.

Delicate apparatus is maintained by the Weather Bureau at a number of points to measure and record the intensity of the radiation received from the sun. The correlation of these records with the development of plant and animal life, as well as with weather changes, remains to be worked out.

Investigations are conducted in certain arid and semiarid regions of the West for the purpose of determining the loss of storage water by evaporation. These results are of direct value to engineers in planning city water supply systems and water and irrigation reservoirs.

The Climate.

The Climatological Division of the Weather Bureau has a vast accumulation of data for showing the climate in all parts of the country. These data are from the regular Weather Bureau stations, some of which have been in operation nearly 50 years, as well as from some 5,000 cooperative or voluntary observers. Some of the latter represent more than 50 years of careful, conscientious effort on the part of men whose ambition has been to determine the climate of their locations.

The outfit of a cooperative observer consists of a rain gauge and standard thermometers, as shown by figure 7. From the data accumulated, engineers can determine the probable water supply and possible power over watersheds; the farmer can determine the average temperature and precipitation, as well as the probable frost dates in their relation to types of farming and farm operations; prospective purchasers need not be in ignorance of climatic conditions in (to them) new ventures; and the investigator can determine the climatic distribution of crops, and the effect of the weather on their yield.

Bulletins are published each month showing the precipitation and highest and lowest temperatures at each station every day of the month, as well as the total precipitation and the temperature averages and their comparison with the normals for the month.

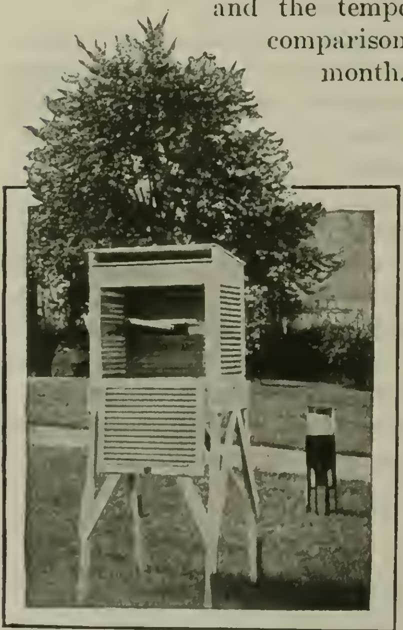


FIG. 7.—A cooperative weather observer's equipment: Maximum and minimum thermometers in a latticework shelter, and a standard 8-inch rain gauge.

Climate and Crops.

The climate determines the distribution of vegetation, types of farming, and proper farm operations. These factors have been studied, and the whole globe can be divided into broad general bands, or districts, where particular crops dominate, because of climatic conditions. It is climate, for example, that causes over 75 per cent of the cultivated land in the Southern States to be given to intertilled crops, while over 90 per cent of the cultivated land in the Northwest is devoted to broadcast crops.

Climate is responsible for a harvest value of $10 to over $20 per acre from crops in parts of the Mississippi and Missouri Valleys, as compared with less than 10 cents per acre over large areas in the far Southwest.

Weather and Crops.

While the effect of climate on plant distribution has long been known, the effect of current weather in varying the yield of crops is a study of recent development. That yield is affected by weather is, of course, well recognized, but it

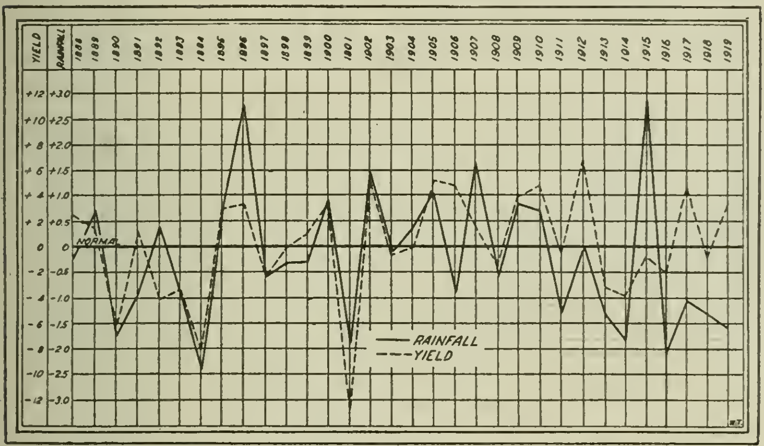


Fig. 8.—The effect of the rainfall for the month of July alone on the average yield of corn in Indiana, Illinois, Iowa, and Missouri during each year from 1888 to 1919, inclusive.

has not been thought possible until recently to select one weather factor from the many that affect crop development, and to show its influence on the yield.

Recent studies have demonstrated that this is possible, however, and have shown that most crops have a comparatively short critical period when favorable weather will cause a large yield, and unfavorable weather a small yield, largely without regard to earlier or later conditions.

With corn, for example, rainfall is the meteorological factor of greatest importance in varying this yield, and the critical period of growth is at about the time of blossoming. The relation of the rainfall during the month of July alone to the yield of corn in the four greatest corn-producing States is shown in figure 8.

In Ohio alone, in a period of 60 years, an average increase of one-fourth inch in rain in July, at the critical rainfall period, caused an average increase in the yield of corn of 6,000,000 bushels, while a one-half inch increase in rain made an average increase in the yield of over 15,000,000 bushels. A more detailed study in this State showed that the most important 30 days from a rainfall point of view is from July 15 to August 15, while the most critical 10 days is from August 1 to 10.

On the other hand, temperature has a greater influence than rainfall in varying the yield of potatoes in Ohio. July is the critical calendar month, and it must be cool for best results. In a period of 54 years, with each average decrease

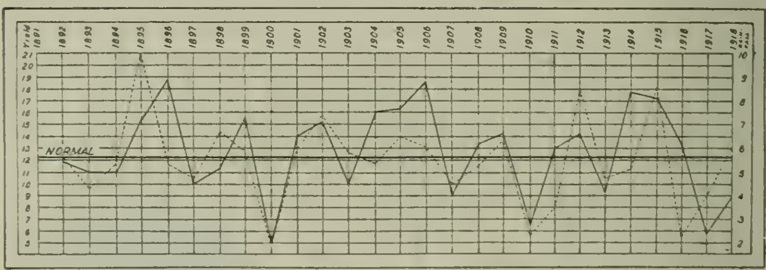


FIG. 9.—Relation between the total rainfall in May and June and the yield of spring wheat in North Dakota.

of 1.6° in the mean temperature for the month of July the yield of potatoes increased, on the average, 6.3 bushels per acre, or a total of 1,096,200 bushels.

In the State of New Jersey, during a period of 33 years, the yield of potatoes averaged 25 bushels an acre greater when July was appreciably cooler than when it was considerably warmer than the average, which means a variation in yield for the State of over 2,000,000 bushels.

The yield of spring wheat in North Dakota is influenced largely by the rainfall in May and June, as is shown by figure 9. In general, however, the most critical period for small grains is when the berry is in the milk or dough stage. Hot and dry weather at this time will reduce the yield of high-class seed very materially.

Studies of this character frequently bring out unusual and unlooked-for results. Figure 10, for example, makes plain that a heavy snowfall in March is very detrimental to winter wheat in northwestern Ohio. This is contrary to the usual opinion of the effect of a late snowfall on winter wheat, but the evidence of the chart seems conclusive.

A full knowledge of the effect of the different weather factors on the development of crops, and especially of the most critical stage of development, and the factor having the greatest influence in varying the yield, would be of almost untold value to the farmers and other business men in this country.

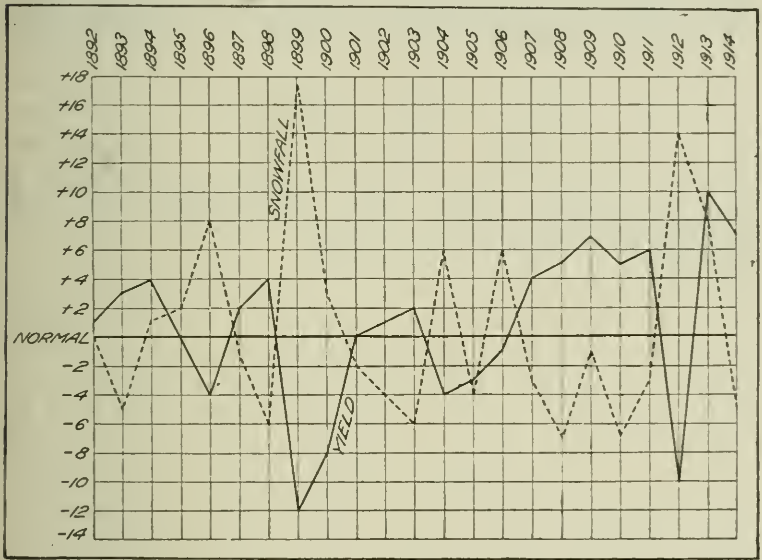


FIG. 10.—Relation between the total snowfall for the month of March, at Wauseon, Ohio, and the yield of winter wheat in Fulton County, Ohio. Wauseon is near the center of the county.

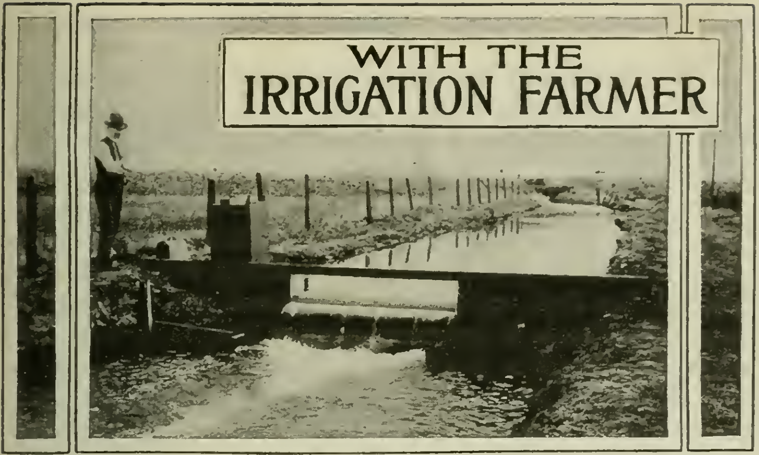
The Weather Bureau has made a sufficient start in this direction, with the small funds and few men available for the work, to show its tremendous possibilities. To carry the study along properly, however, agricultural meteorological stations should be established at all the experiment stations in the country, where detailed records could be kept of meteorological and crop development factors over a period of years.

When this is done and the new science of agricultural meteorology is developed, we believe it will be possible to convert rainfall into terms of dollars and cents, and temperature and sunshine into the ability to buy more machinery for farm development, more complete equipment for the housewife, and better education for our sons and daughters.

Does It Pay to Talk About the Weather?

The total appropriation for the Weather Bureau during 1919 was $1,880,210. A very conservative estimate of the returns to interests directly relating to agriculture, including horticulture, forestry, etc., is placed at $17,580,000, while the estimated return to commerce, navigation, and other interests is $56,000,000. As the marketing of crops is dependent to such an extent on commerce and navigation, at least one-fourth of the last named amount should be credited to the return to farmers. This makes the total appropriation for the Weather Bureau return to agriculture alone, at a most conservative estimate, fully 1,680 per cent, and to all interests not less than 3,913 per cent.

WITH THE IRRIGATION FARMER



By Samuel Fortier,
Chief of the Division of Irrigation Investigations,
Bureau of Public Roads.

THE distinguishing feature of the climate of the far western States is its low rainfall. Over the greater part of this extensive territory the annual precipitation in normal years is less than 15 inches and over large areas it is less than 10 inches. The exceptions to this rule are to be found mainly on the higher ranges of mountains, which intercept moisture-laden winds and where there is a larger precipitation, chiefly in the form of snow. This snow, when lodged and compacted in deep mountain recesses, forms the chief source of water supply for irrigation.

If the snow which falls on the elevated ranges melted gradually so as to maintain a fairly equable stream flow during the irrigation season, much larger areas could be watered. Actually, the bulk of the snow melts quickly and the resultant run-off creates floods which carry large quantities of valuable water to the sea. In consequence there is a wide seasonal fluctuation in the natural flow of streams. For instance, the maximum flow of the South Platte River at Denver, Colo., is over 24,000 second-feet, while the minimum flow is 40 second-feet. That of the Rio Grande at Del Norte, Colo., is 14,000 second-feet in flood periods and 70 second-feet in low-water periods. The Salt River at Granite Reef, Ariz., has been known to carry 143,000 second-feet, but 300 second-feet is the minimum. The Sacramento River at Red Bluff, Calif., carries 254,000 second-feet in flood as compared with a minimum flow of 4,000 second-feet in midsummer.

The greater part of the land of the western States is utilized chiefly for grazing purposes. The arable lands of the Rocky Mountain and Pacific Coast States constitute, it is believed, less than one-fourth of the total area. A part of these arable lands is irrigated, another part is farmed dry, while the remainder is still in its natural condition and is used chiefly for grazing. As closely as it can be estimated, the area at present irrigated in this country is, in round numbers, 18,000,000 acres, and the area for which water is available throughout the 17 western States does not exceed 50,000,000 acres, or less than 5 per cent of the total area. It follows that more than one-third of the total area of western lands susceptible of irrigation has already been reclaimed, that in a broader sense the revenue to be ultimately derived from irrigated products will be largely dependent upon economical use of water, and that the utilization of the limited water supply sets a fixed limit to further production under irrigation. It likewise follows that if only 5 acres out of every 100 acres can be ultimately irrigated, owing to the lack of water, a premium will be placed on the relatively small areas for which water is available. Such lands will be called upon to produce sufficient forage to feed range stock during severe storms in winter; and when droughts occur and dry-land crops partially fail, the crops grown on irrigated fields will constitute the farmer's main dependence. At present the trend is in this direction. In recent years the farmers of the West have depended more on their irrigated holdings. The prevalence of droughts, the small average yearly returns from dry farming, the high prices of many irrigated products, and the scarcity of labor have exerted more or less influence in causing farmers to concentrate their efforts to a greater degree on relatively small irrigated tracts and to bring these to the highest state of production. This, in turn, has created a greater demand for water, increased its value, enhanced the price of irrigated land, and awakened a desire to lessen the waste of water by the adoption of better appliances and by more skillful use.

Two Kinds of Irrigation Farmers.

The irrigators of the West may be classed in two groups, those under Government projects and those under private irrigation enterprises. The reclamation act, under which Government projects have been built, provided, as first passed, for the repayment of the cost of the water right in not more than 10 yearly installments. This was found to be impracticable, and by an amendment passed in 1914 the period of paying for a water right was extended to 20 years. In no case is any interest charged. The interest exemption is important. The interest at 4 per cent per annum on deferred payments, if compounded annually, would amount to over 80 per cent of the construction charge. Furthermore, several years intervene, on an average, between the time of construction and settlement. If the interest for this period were similarly computed and added, it would increase the total charge to over 100 per cent. In other words, the United States grants a bonus to all settlers on projects operating under the reclamation act, equaling, if not exceeding, the construction cost of the works by the exemption of all interest charges on deferred payments. Over 400,000 people living on or dependent on Government reclamation projects are at present receiving the benefits of these liberal terms. They pay no interest whatever on an expenditure of nearly $125,000,000 made by the Federal Government in their behalf.

The Nation has not been so liberal in dealing with the second group, those under private irrigation enterprises, and yet this class constitutes more than 90 per cent of the total. Before the war Congress granted to the Department of Agriculture, for the investigation of irrigation problems, an annual appropriation of $102,440, but this amount has since been reduced, and for the current year it is $62,440. When this fund is distributed over the 17 western States, not to speak of the irrigation of rice in the Gulf States and the irrigation of truck crops along the Atlantic coast, the amount available for any one State is quite small. In many cases, however, Federal funds are augmented by State funds under cooperative agreements. Before the war, when a larger appropriation was available, it was possible to contribute dollar for dollar with the States cooperating. Since the funds for this purpose were reduced, it is seldom that this can be done, but several States and State institutions, rather than abandon the cooperative investigations, are now contributing more than is allotted by the Department of Agriculture.

The Need of Stored Water.

In the irrigation of over 16,000,000 acres under private enterprises of one kind or another little storage has been provided. The greater part of the canal systems are dependent on the natural flow of the streams for their water supplies. During periods of high water large quantities are diverted and wastefully used, while in July, August, and September, when the most profitable crops require the largest amount of water, little is available. In many localities in the West the storage of a relatively small quantity of water to tide the farmers over the low-water period would result in a doubling of the area irrigated and a like increase in the profits obtained. The reasons that so few dams have been built to impound irrigation water are mainly the cost of such structures and the difficulties encountered in financing them.

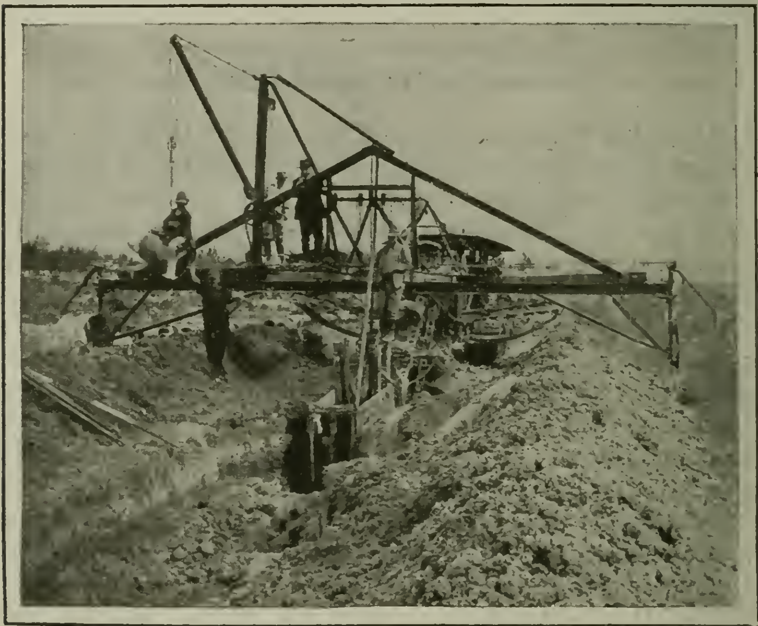
Under private enterprises large numbers of independent canals and ditches divert water from the same stream, resulting in low efficiency and much waste. None of these small enterprises is financially able to build the usual type of storage dam costing up into the millions of dollars. It is seldom that a number of such enterprises, when cooperating, can undertake a work of such magnitude. About the only feasible solution of a problem of this kind is to induce all the water users on a stream to merge their interests in a single organization, such as an irrigation district, and in this way provide sufficient security to float long-term bonds with which to obtain money to build the necessary storage works. In work of this kind the human problem is the most difficult to handle. When hundreds, and in many cases thousands, of farmers must be persuaded to cooperate and come within the jurisdiction of a single governing body, it is difficult for local men, on account of animosities of long standing, to unite diverse interests. Such a task, as recent experiences have demonstrated, is much less difficult when undertaken by a representative of the Federal Government. The Government engineer is not supposed to know anything of local factions, jealousies, and disputes. He has no private interests to serve, and his best efforts are devoted to improving the condition of the community as a whole. A small amount of money expended in helping communities to make the right kind of start in this direction and in exercising a general supervision over their organization, management, and construction could not but result in lasting benefit to the irrigation farmers.

Community Irrigation Interests.

There has been no time since the present irrigation work of the Department of Agriculture was organized 21 years ago when community irrigation activity has been so great as at present. The seed of cooperation early planted by the irrigation pioneers of Utah, Colorado, and California has brought forth an abundant harvest of cooperative and mutual irrigation companies and irrigation districts. The principle of ownership and control by irrigators of the water and works upon which their agriculture depends has thus become so firmly established as to be a fixed western irrigation institution. In one way or another the specialists of the Division of Irrigation Investigations of the Bureau of Public Roads have studied at close range the organization and operation of nearly every important community irrigation enterprise in the country, and to a considerable proportion of these enterprises, particularly of the irrigation districts, they have rendered substantial help. Possibly even more important than the help rendered to individual irrigation districts has been the help rendered in revising and establishing our present body of irrigation-district laws. This has largely had to do with encouraging the strengthening of State supervision over the organization and the financial management of districts, which in turn has made at least home markets for irrigation district securities that but a decade back, because of early mistakes under noncontrol and nonsupervision by the States, were hardly salable at all.

In Utah the irrigation district problem is the consolidation into more efficient single systems of the numerous independent, wasteful, often paralleling ditches, shovel-built in early days by the sturdy followers of Brigham Young.

To cite only one instance, engineers of the Bureau of Public Roads are helping the farmers about Ogden in the formation of a single irrigation district of 93,000 acres within which over 40 independent systems, operating under 149 separate and distinct water rights, now furnish irrigation water. Through lack of storage of flood waters much of this area now receives water only in the early summer, much of it has



Modern Machines for Extensive Work.

Excavator at work on a trench for tile on a drainage district in Wyoming.

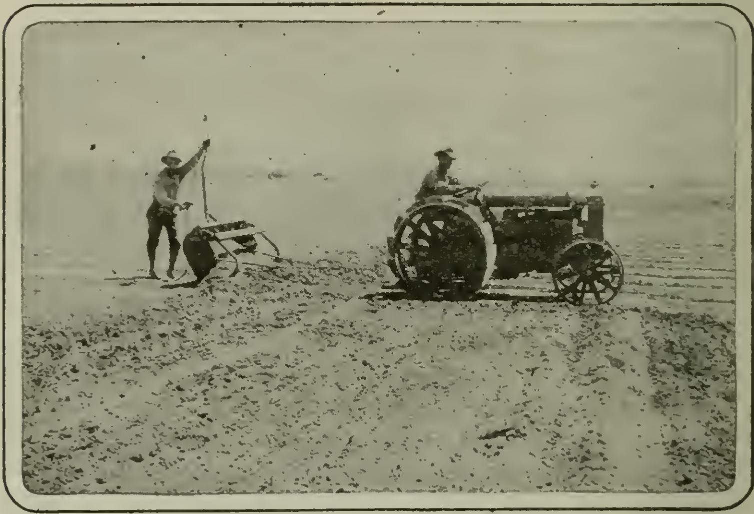
none at all, and much of it is so overirrigated in months of plenty and so affected by seepage from leaky ditches as to be unsuitable, until reclaimed. Specialists of the bureau have a thorough knowledge of the resources and latent wealth of this locality and, in conjunction with representatives of the State engineer's office, the Utah Agricultural College, and the local farm bureau, are awakening the interest of the community in the utilization, through united effort, of these neglected opportunities.

The more important present irrigation district movements in California are a little different from those in Utah just described. They involve in some instances a similar consolidation of present smaller systems; but, more important, they involve cooperation in storage construction on a larger scale than heretofore attempted by community irrigation enterprises in this country. A representative of the Department of Agriculture has recently ascertained that the six California major irrigation districts now actively constructing or planning new or additional irrigation works expect to require more than $100,000,000 for construction purposes during the next five years. In fact, the total reported as needed in the next 5 to 10 years by existing California irrigation districts and those far enough along in their organization plans to make them of live present interest is $174,000,000. While all of the expenditures now under consideration are not likely to be made within the next decade, the mere statement of the amount shows the present importance of the community irrigation movement in this State and suggests the call that comes to the Division of Irrigation Investigations.

The Drainage of Water-Logged Lands.

Community action is likewise necessary in the drainage of wet lands. It is seldom that the individual farmer can find, at a reasonable cost, an outlet for waste water. He must as a rule cast in his lot with his neighbors and with all those whose lands are being damaged. Thus the drainage district is very similar to the irrigation district in form of organization, but differs from it in the object to be attained.

No census has ever been taken of the extent of irrigated lands needing to be drained, and, if attempted, such a census would be difficult to take on account of the large number of classes under which water-logged lands might be listed. It is perhaps not far from the truth to state that 10 per cent of the irrigated lands have been rendered well-nigh worthless through water-logging and the rise of alkali, and that a larger percentage of the remainder is being more or less injured from these causes. A community having a large percentage of what formerly constituted its most productive lands rapidly becoming practically worthless is in a pitiable condition. Without organization, money, or a knowledge of the remedies to be applied, they are apt to stagnate. It is at this stage of proceedings that the drainage engineer of the Department of Agriculture can render the most effective service. By making a technical examination of the lands needing drainage as well as those menaced by a rising water table, estimating the cost, and outlining a drainage district and its organization, he can usually at small cost start such communities on the road to prosperity by pointing out what is needed, helping them to organize and exercising a general



Getting the Land Ready.

The tractor replaces a four-horse team in throwing up borders on land previously leveled.

oversight over the construction of a drainage system. Such supervision is being exercised to-day with satisfactory results in a dozen Western States, and might be greatly extended if more funds were available.

The Preparation of Land for Irrigation.

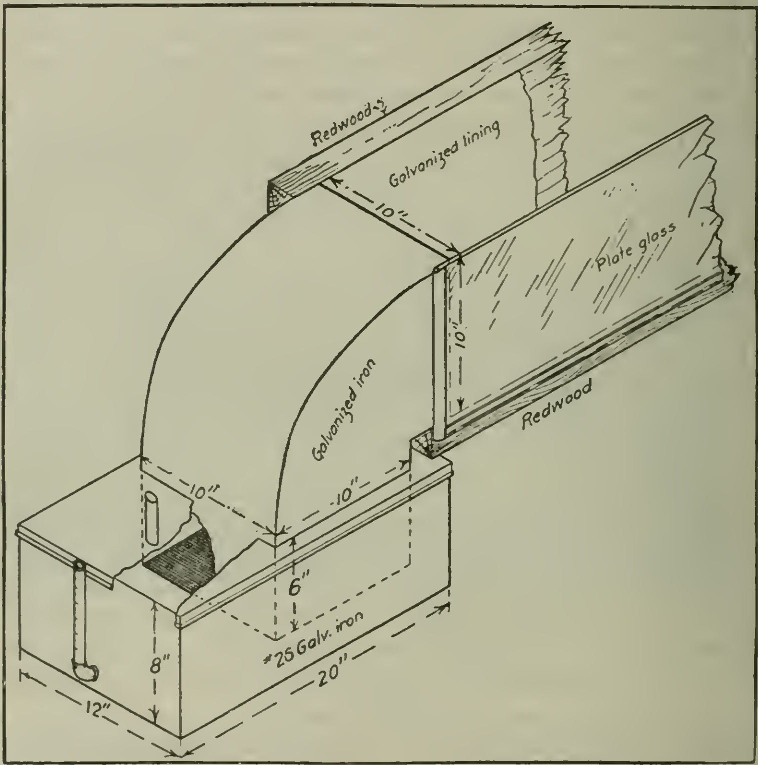
After a water supply has been provided and conveyed to the highest corner of each farm, a large amount of labor and money have to be expended in grubbing out sagebrush, plowing, leveling, and grading the surface of fields, building the necessary supply and field ditches with their accompanying structures; in short, preparing the land for efficient irrigation and profitable crops. The manner in which this work is done determines in a large measure the profits derived from irrigation farming. It pays to prepare the surface of fields in a thorough manner. Measured in capital invested for the betterment of the irrigated farm, the difference between a field poorly prepared and one well prepared would not exceed, as a rule, $12 an acre. The interest on this investment at current rates would be about $1 a year. The benefits to be derived from this investment, which costs $1 per acre per annum, would consist in larger yields, a better quality of crops, a reduction in the waste of water, labor saved in irrigating, lessening the risk of water-logging soil, and enhancing the value of the farm.

Efforts have been made to adapt the methods used to local conditions. At least nine standard methods have been developed and put in practice for the preparation of land and the application of water. It is no easy task to choose the right one, and any assistance offered to water users either in the form of published reports or advice bearing on this subject is not only gladly received but put to good use.

Soil Moisture.

Soil moisture is that form of moisture held in the soil by capillarity and available for plant use. The popular conception is that this moisture may move around in the soil quite freely and somewhat rapidly. Especially is it thought to move upward to the soil surface freely and from considerable distances. Experimental work by the Division of Irrigation Investigations upon the capillary movement of soil moisture from a wet or damp soil to a dry soil has demonstrated that the popular idea is erroneous. This work showed that the lateral movement of soil moisture by capillarity during a period of 30 days through a distance of 6 inches in a loam soil was less than half enough to support an alfalfa crop. During the same period of time, moisture did not move from the wet soil 18 inches laterally into the dry soil. Barley plants, the roots of which were confined within a space 6 inches square, within a body of wet soil, thrived for about 30 days, then began to wilt, and within two weeks more were all but dead for lack of moisture. Analysis of the soil showed plenty of moisture at 2 inches from the roots.

The upward movement of soil moisture is not so rapid or extensive as the lateral movement. Numerous experiments gave results tending to show that the downward movement of soil moisture by capillarity over a period of 30 days was approximately one and three-fourths times as far, and that twice as much moisture moved down as up. Gravity is work-



Testing Movement of Soil Moisture.

Isometric view of open flume connected by wick to supply tank from which soil obtained moisture.

ing all the time upon soil moisture, tending to pull it down below the plant roots. The experiments have demonstrated that capillary moisture is influenced greatly by gravity and that soil moisture, once below the root zone, is all but entirely lost in so far as nourishing plants is concerned. Numerous tests have shown that capillarity will not move it through even a few inches rapidly enough or in sufficient quantity to grow and mature a grain crop or support an alfalfa hay crop.

The capillary movement of soil moisture from a body of free water into a body of dry soil differs only in degree from the movement of moisture from a wet soil into a dry soil. The upward movement of the moisture in a loam soil from ground water will be farther in one day than it would be in 30 days from a body of wet soil and the quantity of moisture moved would be even relatively greater. In a very fine loam soil of high capillary power it was found that if barley roots did not reach within less than 40 inches of the ground water. the plants would not mature. Sufficient moisture would not reach the roots to satisfy the plants' needs.

The downward movement of moisture by capillarity, when the source of moisture is free water, may extend indefinitely in distance and may be relatively quite large in quantity. In fact, bogs may be formed in this way.

The experiments indicate that gravity is a very potent factor in soil-moisture movement and that one great value of capillarity is to hold the moisture and cause its relatively slow transference from one soil particle to another.

Irrigation Water from Underground Sources.

Water for irrigation from underground sources may be obtained from springs, flowing wells, or pumped wells. The irrigated area in the 17 western States in 1909 was reported at about 13,750,000 acres. Of this total, the surface-water supply irrigated an area of about 13,056,000 acres, spring-fed supplies about 200,000 acres, flowing wells about 140,000 acres, and pumped wells approximately 300,000 acres. It is thus evident that at that time pumped-well water was the second greatest source of supply for irrigation. At the present time there are no authentic data published showing the changed aggregate or the proportion of each of the above classifications, but the data obtained in the cooperation this division has extended to various outside agencies indicate a rate of development of irrigation from pumped-well supplies far exceeding that of any of the other three classifications. In California, which has done most in making use of underground water, records show that in 1909 there were 9,297 pumping plants in operation, irrigating 277,000 acres. In 1914, this number had increased to 24,589 plants, and to-day it is estimated that there are 30,000 pumping plants, irrigating between 750,000 and 800,000 acres. New Mexico probably follows, with Utah, Colorado, Nevada, and Arizona showing rapid increase in development, though not in proportion to that of California. With proper encouragement and assistance, there are vast possibilities in the extension of irrigated areas from pumped supplies. Only about four years of extensive research in Utah has resulted in the sinking of wells in Cache Valley, Utah Valley, Uinta Basin, and in southern and southeastern Utah, with the development of the underground water of that State only begun. There are possibly more appeals from farmers for assistance and more requests for information on this subject addressed to the Department of Agriculture than on any other pertaining to irrigation. Cooperative agreements with 6 of the 17 western States include work on underground water supply, study, and development, and there are petitions from other States for such aid.

Furthermore, there are areas in several of these States where water applied from surface sources has percolated through the soil of the higher lands and water-logged the lands of the lower levels. Pumping from wells or trenches sunk on these lower areas not only lowers the water table of the water-logged lands and therefore reclaims them, but in addition furnishes water for higher lands supplied from the surface water system.

The Distribution of Irrigation Water.

As has been pointed out, the bulk of the water supply for the irrigated farms falls upon elevated ranges. If uncontrolled this water would flow down natural channels unutilized and eventually would be lost in the ocean or would evaporate. For its utilization laws are passed, regulations formulated, administrative officers appointed, and water courts created. So important has legislation regarding water become in many of the western States that a large part of the laws on the statute books relate to this subject. Much money has likewise been expended in building diversion works and channels. If the main canals and laterals built to convey irrigation water in this country were placed end to end, they would encircle the globe six times. Some of these structures and canals are well designed and built, but the large majority are mere makeshifts.

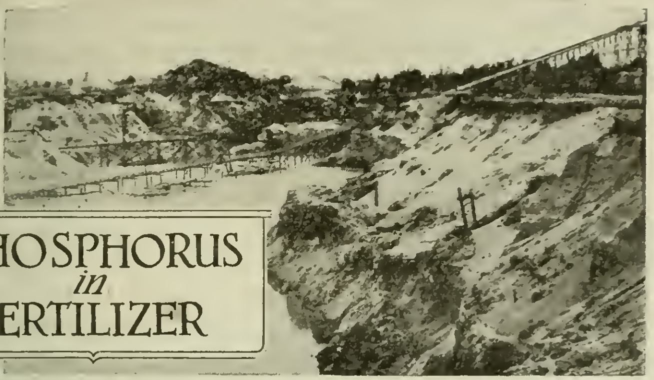
As an aid to the proper control and distribution of irrigation water, the engineers of the Division of Irrigation Investigations have sought to improve the laws relating to the control of public waters, render State administrative systems more effective, determine the water requirements of different types of soils, design better structures, and increase the carrying capacity and efficiency of channels. In investigations of this character the main object sought has been to benefit the many rather than the few. The data collected regarding the service which water performs in irrigating crops and the quantities of water which should be allotted to definite tracts of land have been widely disseminated, and all are at liberty to make free use of this information. The same is true of the results of experiments to ascertain the carrying capacities of canals, pipes, and other conduits. All conduits should be large enough to satisfy the requirements of the lands they serve. On the other hand, all money expended in making conduits larger than necessary is wasted. Although the farmer may have no part in making these highly technical adjustments, he is always an interested party, since he pays the bills. At first thought it would appear that water has been conveyed from place to place for so long a time that all the fundamental facts relating to flow have become known to hydraulic science. While this is true in a degree, the new materials used and the new types of conduits which have been devised and introduced into general practice during the past two or three decades have rendered many of the old formulæ obsolete.

Transmission losses in earthen channels being one of the largest sources of waste, the use of concrete has recently been investigated with a view of making a stronger, more uniform and more serviceable pipe of this material. A cooperative arrangement was entered into with the State engineer of California and the California Concrete Pipe Association, by which the materials used in making pipe have been carefully investigated, the proportions of the several ingredients, including water, standardized, and numerous specimens and joints of pipe tested. As a result the weak, porous, and improperly made pipe can no longer be classed as good pipe, and a much higher standard has been adopted for all pipe made by the association.

The Economical Use of Water.

In many of the western States fertile raw land is cheap and abundant, but water is valuable and scanty. This fact can not be too often reiterated or too strongly impressed upon all. As a result of long-continued and carefully conducted experiments the amount of water which different crops require under any given set of conditions of soil and climate has been fairly accurately determined, but much remains to be done in conveying water to the place of use with the least possible loss and in spreading it over the surface of soil so as to minimize the losses due to evaporation and deep percolation. Notwithstanding all the improvements brought about in the past 20 years, it is doubtless still true that on the average for every 3 gallons of water diverted from streams only 1 gallon serves to nourish plant growth. Were it possible to convey and use water in irrigation with the same degree of efficiency that electric current is transmitted and applied the water now used and wasted might serve double the present area. Here, too, the activities of the Division of Irrigation Investigations are accomplishing beneficial results. The demonstration in all the larger irrigated centers that larger yields and a better quality of crops can be grown with a medium rather than an excessive amount of water is leading farmers to realize that the use of too much water is a detriment in that it water-logs their soil, causes the alkali to rise, and otherwise injuriously affects both crops and soil. However, the waste of water is not wholly due to the farmer's carelessness or lack of skill. It arises from absorption and percolation losses in canal systems, in too liberal allowances granted by judges in issuing decrees, and in defective State laws and administrative systems.

PHOSPHORUS *in* FERTILIZER



By WILLIAM H. WAGGAMAN,
Scientist, Bureau of Soils.

AN eminent scientist, in emphasizing the importance of phosphorus and its compounds, once said, "No phosphorus, no brain."

While it is true that this element is actually contained in the tissues of the brain, he might very well have added, "No phosphoric acid, no bone, no flesh, no food, no life," for this compound of phosphorus enters into the structure of plants, animals, and men, and upon it we depend for our very existence.

The use of phosphatic materials as fertilizers goes back so far that no one knows when their agricultural value was first discovered. Practically all of the fertilizers of ancient times contained phosphoric acid as one of their ingredients, and such materials were used with considerable effectiveness long before their composition was recognized. Manure and animal refuse, bones, fish, and guano were among the earliest fertilizers known. All of these contain phosphoric acid, and in some it is the predominating ingredient. When science taught us the nature of phosphoric acid and the part it plays in crop production we began to use other sources, until now we are supplying it to crops from the animal, vegetable, and mineral kingdoms.

Not only is phosphoric acid essential to the growth of plants, but it plays a more important rôle than any other fertilizer material in the maturing, fruiting, and ripening of crops. This, coupled with the fact that many soils are actually deficient in phosphoric acid, has caused it to be used as the basis or backbone of nearly all mixed fertilizers.

Greatest Phosphate Deposits in the World.

By far the greatest quantity of phosphoric acid used in fertilizers is derived from the mineral phosphates, and the United States is particularly fortunate in having larger deposits of this mineral than any other nation. As in the case of many of our other now highly prized possessions, however, the nature and value of phosphate rock was not recognized until relatively recent times. The phosphates of South Carolina, the first important deposits of the mineral exploited in this country, were not discovered until 1862, and it was a considerable number of years later before mining operations were conducted on a large scale. The discovery in Florida of phosphate rock of a considerably higher grade soon attracted capital to that field, and later the same mineral was discovered in Tennessee, then in Arkansas and Kentucky, and finally huge bodies of the rock were found underlying vast areas in Utah, Idaho, Wyoming, and Montana. These latter deposits are so enormous that they exceed in tonnage all of our other known phosphate fields combined, and according to the latest estimates of the United States Geological Survey contain more than 6,000,000,000 tons of high-grade rock and many times this amount of lower-grade phosphates.

Not only does the United States possess the greatest phosphate deposits in the world, but our production of this basic fertilizer material exceeds that of any other nation. Besides supplying our own ever-growing demands, we have been aiding materially in maintaining the crop-producing power of European and Asiatic soils by our phosphate exports. These exports prior to the war amounted to from 500,000 to 1,000,000 tons annually.

While a considerable tonnage of phosphate rock is finely ground and applied to the field without other treatment, the vast bulk of the rock produced for agricultural purposes is treated with sulphuric acid and manufactured into what is known as acid phosphate, a fertilizer material readily soluble in water and quickly available to crops. Acid phosphate is the basis of practically all mixed fertilizers, and hence most of the world's output of sulphuric acid is used in its production.

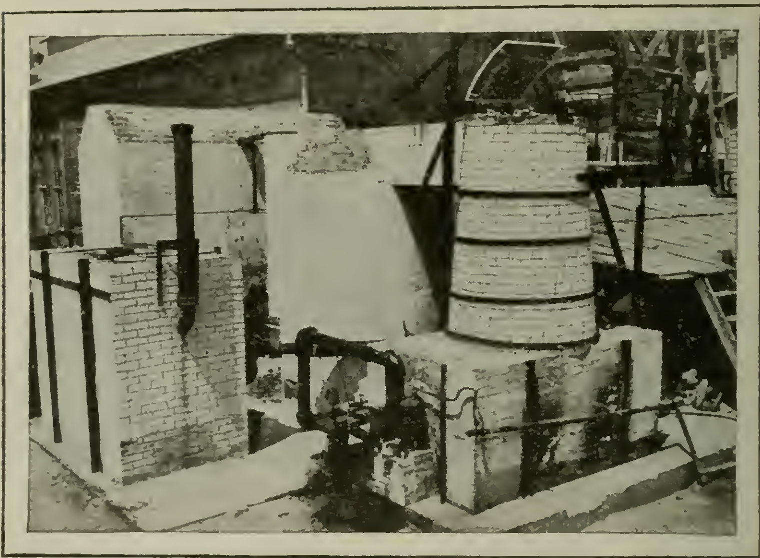
Throwing Fertilizer on the Dump Heaps.

It is the history of practically every industry that crude and rule-of-thumb methods of manufacture are employed

Mining Our Basic Fertilizer Ingredient.

A phosphate mine in Florida, the State which supplies the bulk of the phosphate rock used for fertilizer purposes.

for a long period before scientific knowledge and thorough acquaintance with the processes involved bring about the changes necessary to put production upon the most sound and economic basis. The fertilizer industry is no exception to this rule, and the production of phosphoric acid for fertilizer, from the time the rock is mined until it is mixed and bagged for application to the field, is gradually becoming recognized as involving some of the crudest and most wasteful methods known to any industry. It is logical, perhaps, that we should be wasteful as long as we have in sight such immense quantities of high-grade material readily and cheaply obtained; but the time has now come when the cream of the more accessible deposits of phosphate rock in the East has been skimmed, and, while the vast phosphate deposits in the West are still practically untouched, they are so far from the fertilizer market that their exploitation presents a serious economic problem. Moreover, both labor and transportation charges have soared to unprecedented heights; so we are coming to realize that more careful methods of mining and handling phosphate rock with due regard to the conservation of these deposits must be practiced, and that scientific



Latest Method of Producing Phosphoric Acid.

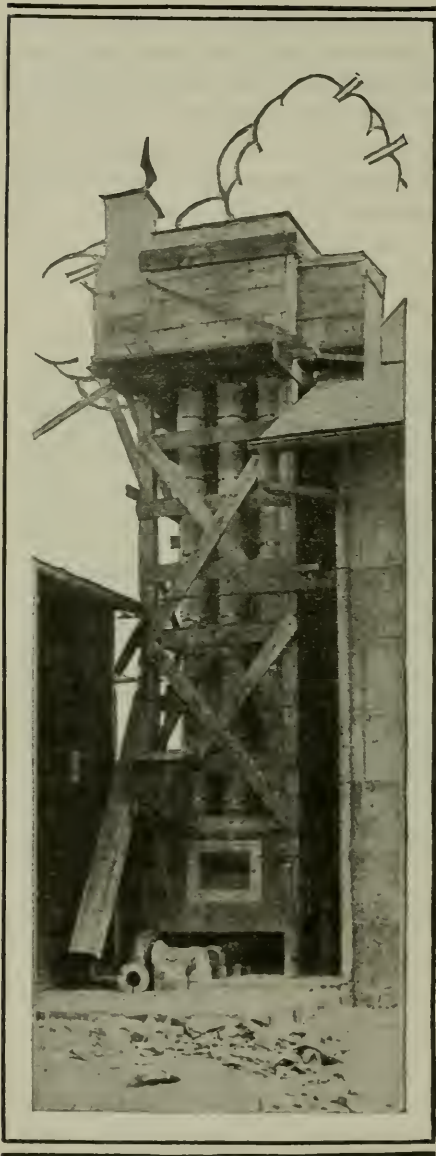
A small furnace at Arlington Farm, Va., in which mixtures of phosphate rock, sand, and coke are smelted at high temperatures and the phosphoric acid distilled off and collected.

methods of manufacturing a finished product sufficiently high grade or concentrated to withstand heavy transportation charges must be applied in the phosphate industry.

One of the greatest examples of colossal waste of a marketable mineral is found in the Florida phosphate fields, which have had an average annual production of 2,000,000 tons of rock for the past decade. In order to put out a high-grade marketable product, the phosphate is put through an elaborate washing and screening process, during which in some instances two-thirds of the phosphate is washed out upon the dumps, with a loss of several million tons each year. Of course, it has been argued that this can not be regarded as waste until some economic means has been devised of separating the mineral from its impurities, but when the losses entailed are compared with those occurring in the mining and smelting of metalliferous ores they appear little short of scandalous. Metallurgical practice, for instance, has now reached such perfection that old dump heaps and tailings containing only a fraction of 1 per cent of a metallic element are being worked over with economic success. It seems, therefore, almost criminal that material containing from 12 to 18 per cent of a marketable ingredient, even though this ingredient may be relatively low priced, should be heedlessly thrown away.

Paying Freight on Filler.

But this is not all. After the high-grade rock has been recovered it is shipped long distances to the fertilizer factories, where it is treated with an equal weight (approximately) of sulphuric acid and manufactured into acid phosphate. The average grade of acid phosphate put upon the market contains 16 per cent of phosphoric acid, or about one-half of that contained in the original rock. This comparatively low-grade product is again shipped, and frequently long distances, either to fertilizer-mixing plants or to the farmer. Freight, labor, and handling charges are being continually paid upon 84 per cent and more of natural or artificial filler contained in the product, and by the time it reaches the consumer these charges have amounted to a very tidy sum. Were it not such a serious matter the present procedure would appear ludicrous, and to one engaged in some other manufacturing line and unacquainted with the fertilizer business the methods employed in the latter industry appear highly inefficient, to say the least. The manufacturer of iron or steel, for example, could hardly conceive of a condition where his finished product would contain less of the marketable ingredient than the ore from which it was derived, and to ship and reship material from place to place while the percentage of its valuable ingredient was con-



Collecting Phosphoric Acid Fumes.

The Cottrell electrical precipitator, originally devised to abate the smoke and fume nuisance and now being used in the industries for saving valuable by-products.

stantly being decreased would seem at first sight little short of industrial suicide. Yet such is the condition prevailing to-day in the phosphate industry, an industry which is the backbone of the fertilizer business and the basis of the agricultural wealth of a considerable portion of the eastern and southern States.

It is recognized that concentrated phosphatic fertilizers must be considerably diluted before they can be safely applied to crops, but it is a needless and foolish practice purposely to manufacture low-grade goods far from the points of consumption, when the filler or diluting agent can just as well be incorporated in the fertilizer almost at the farmer's door.

The Dawn of a New Era.

A change, however, is slowly but surely taking place in fertilizer manufacture, and the promise is held forth that in the not far distant future crude methods of mining and manufacturing phosphates will give place to efficient and scientific practices which will enable us to market phosphoric acid with the least possible waste of time, money, and material. A number of concerns are producing what is known as double acid phosphate, a product containing from 45 to 50 per cent of phosphoric acid instead of the 16 per cent contained in the ordinary acid phosphate of commerce. At least one concern has placed on the market a compound of ammonia and phosphoric acid which is sufficiently rich in these two fertilizer elements to permit its shipment to far distant points.

The United States Department of Agriculture, through its fertilizer division in the Bureau of Soils, has shown that the great losses of phosphate entailed in mining Florida rock may be at least partially eliminated by mixing the "run-of-mine" phosphate with sand and coke, and smelting the mass in either an electric or a fuel-fed furnace. In these processes the phosphoric acid is driven off as a fume and may be readily collected in concentrated form. While the mechanical and chemical details have not all been solved, the work has reached the stage where these processes hold out great promise of commercial success and bid fair to prolong the life of our phosphate deposits for an almost indefinite period.

The change from rule-of-thumb to scientific methods of manufacture is at the beginning very slow, particularly where capital is tied up in factories and equipment which are producing, and producing profitably. But when this change once starts it goes steadily on, and with each step in advance the movement gathers impetus. This forward movement in the manufacture of phosphatic fertilizers has undoubtedly begun, and it is being hastened by necessity. The day has gone by when we can say "Let well enough alone." Rather the true American industrial slogan is and should be "Only the best is *well enough*."

MILLIONS OF TONS of phosphate are thrown on the dump heap every year.

Phosphoric acid is the backbone of nearly all mixed fertilizers;

And the cost and supply of fertilizer affects crop production, the farmer's income, and everybody's comfort and food supply.

The lumber industry has had a lot of advertising for the wasteful methods it has used in cutting down the forests;

The phosphate industry is not so well advertised in that respect, but the losses entailed in preparing a high-grade phosphate rock for the market are even greater and more serious than in the lumber industry; for we can replant our forests, but when our phosphate deposits are exhausted they can not be replenished.

The United States has the greatest phosphate deposits in the world, but the cream of the deposits in the East has been skimmed and the deposits in the West are so far from the fertilizer market that their exploitation presents a serious economic problem.

Scientific methods, in place of the old rule-of-thumb ways of mining and manufacturing, will give a more economical product and will prolong the life of our phosphate deposits for an almost indefinite period.

RUNTS—AND THE REMEDY

By John R. Mohler,
Chief, Bureau of Animal Industry.

NEED RUNTS among farm animals be accepted as a necessary evil, or can they be prevented? The experience of several hundred practical stockmen and breeders who answered a questionnaire on this subject shows that runtiness is largely preventable. It reveals, on the other hand, that a great many live-stock owners who were consulted in the matter regarded the problem as baffling. In some cases they frankly admitted lack of knowledge on the cause of runty live stock, but expressed a desire to obtain the facts if possible.

Remarkable Differences in Growth.

Animals raised under varying conditions often show great differences in size, appearance, and rapidity of growth. For instance, a bull nearly 3 years old received at the stockyards in Kosciusko, Miss., last year weighed only 300 pounds. In contrast another bull examined by a department specialist in northern Illinois weighed 2,150 pounds as a 2-year-old. The younger bull weighed seven times as much as the older one. Here was a difference not to be explained by any one cause, and in seeking a combination of causes one soon reaches the place where facts are few and opinions are varied. This paper contains the results of a preliminary inquiry on the subject.

The live-stock owners whom the Bureau of Animal Industry consulted regarding the runt problem represented a class of practical farmers whose live stock probably is somewhat better managed than the general average for the United States. A large majority of the stockmen owned cattle officially accredited as free from tuberculosis. Others were cooperating with the department in the "Better Sires—Better Stock" campaign, a national educational movement to improve the average quality of live stock in the country. Yet even on farms of this class, reports indicated that runty ani-

A Good Steer and a Runt.

A year-old Aberdeen-Angus steer (the large one) and a 3½-year-old Piney-Woods steer. Poor breeding is the principal reason of runtiness in this case, with parasites and a variety of other factors as contributing causes.

mals constituted 7 per cent of the total. In connection with this proportion the reports showed that the financial returns on these farms would be increased 13 per cent if runts were absent. This was the average of 535 replies.

Runts by the Million.

Considering that the figures refer to a superior class of farms, they must be regarded as conservative for the country at large, especially since the average includes farms reporting an entire absence (zero per cent) of runts. But even 7 per cent of runty stock is a figure that looms large when applied to the live-stock industry of the country. Seven per cent of approximately 200 million domestic animals means 14 million head, exclusive of feathered stock.

Runtiness, of course, is a general term involving various degrees and may signify either a greatly or moderately stunted growth. Besides, it usually results from a combination of several causes, seldom just one alone. The term

An Assembly of Runty Live Stock.

Reports of the Department of Agriculture indicate that fully 7 per cent of farm animals in the country are of inferior development and that returns from live stock would increase 13 per cent if runts were absent.

runt, as here used, signifies an animal considerably undersized or lacking in development as compared with normal animals.

A total of 846 opinions on the class of stock in which most runts appear gave hogs the doubtful distinction of being first; in fact, this was the opinion of more than two-thirds of the live-stock owners. This conclusion received support also from those who reported the percentage of runty animals on their farms. Whereas the general average of runts for all classes was 7 per cent, reports on hogs alone showed 10.1 per cent of runts. For sheep the figure was 7 per cent, for poultry 6.5 per cent, and for cattle 3.9 per cent.

Breeding and Feeding the Chief Causes.

Seven main causes and 16 contributing ones explain why animals either are born runty or become runty afterwards. Inferior breeding and inadequate or unsuitable feed head the list. The figures following give the consensus of opinion on this subject for 783 farms:

Principal causes of runts.

Cause.	Per cent.
Inferior breeding	31.6
Inadequate or unsuitable feed	30.4
Parasites and insect pests	15.1
Lack of adequate housing and care	12.4
Contagious diseases	4.9
Exposure	2.9
Accident	1.0
Other causes	1.7
Total	100.0

The "other causes" included inbreeding, breeding immature animals, excessively large litters (swine), poor condition of dam, overcrowding at feed, digestive troubles, lack of exercise, weaning too early, unkindness, and a variety of minor causes.

Weaning Time a Critical Period.

The importance of giving live stock suitable care early in life and especially around weaning time is shown by opinions on the time when runtiness appears. More than 85 per cent of runty animals become so between birth and shortly after weaning. Nine hundred and twenty-nine opinions on this subject indicate that 4.4 per cent of runtiness appears at birth, 50.7 in infancy or before weaning, 35.7 shortly after weaning, 7.7 in the early part of life generally, and 1.5 at any time. Many of the replies specifically mentioned hogs and cattle, the great majority indicating that pigs become runty before weaning and calves shortly after weaning. Weaning time or thereabouts is undoubtedly the critical period in the life of a farm animal.

Ways to Prevent Runts.

Opinions on the best methods of preventing runts appear below. The list represents, in a sense, methods of overcoming the principal causes of runts already given.

Methods of preventing runts.

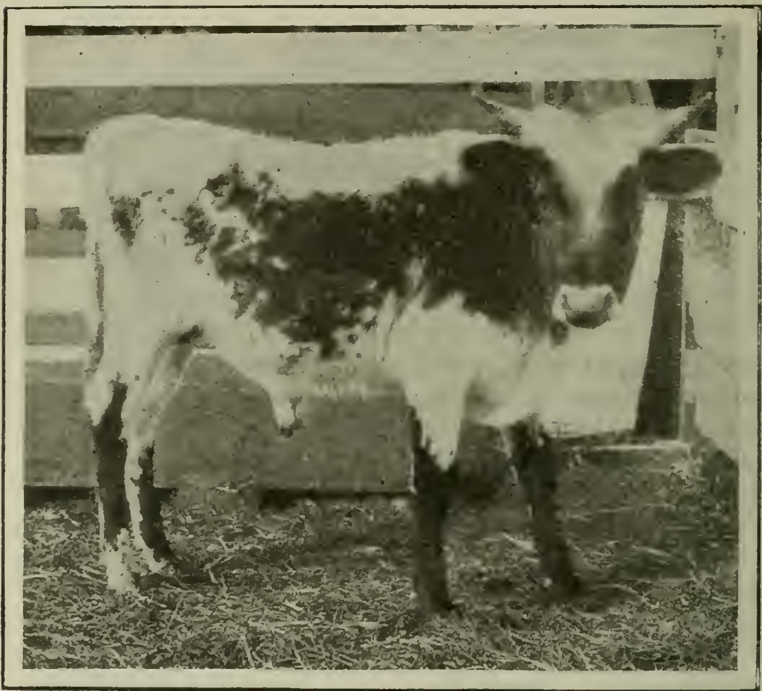
	Per cent.
Proper and adequate feed	31.9
Better breeding	24.3
Good care and systematic attention	18.3
Better housing and sanitation	9.4
Care of dam before birth of young	5.7
Control of parasites (worms, lice, etc.)	3.5
Control of disease	1.2
Other methods	5.7
Total	100.0

It is noticeable that whereas inferior breeding occupies first position as the chief cause of runty live stock, proper and adequate feed is first as a preventive method. Supplementary comments on methods of prevention explain why this is so. "Although inferior breeding causes most runts," one breeder stated, "breeding alone will not prevent runts. You can stunt the best-bred animal by improper or insufficient feed." In this connection another stockman advised, "Study your animals before mating. Do not use inferior stock. Be sure they are free from disease. Then give the 'corncrib cross' and runts will be scarce."

The first five items in the foregoing table received particular comment by persons who reported success in reducing the proportion of undersized animals on their farms. "Better breeding, better feeding, and housing," declared one stockman, "have been my aim, and I have reduced my runts from 40 to 10 per cent within three years. I discovered that I lost money on nine-tenths of the runts I raised to normal size and with the others I just barely broke even. Breed and feed make the animal every time."

Another breeder, who stated that he had no runts whatever, explained, "We have eliminated runts by raising nothing but purebred stock." "We quit the scrub business long ago," still another remarked. "When everyone quits raising scrubs the runts will gradually quit. But so many people say 'Oh, it's a hog or a calf. What's the difference so the service fees are cheap?' Poor, blind people!"

A North Carolina farmer says of reducing runts, "I always try to use a better sire than the dam and in that way get better offspring not only in cattle but in chickens." A stockman



A Runty Bull.

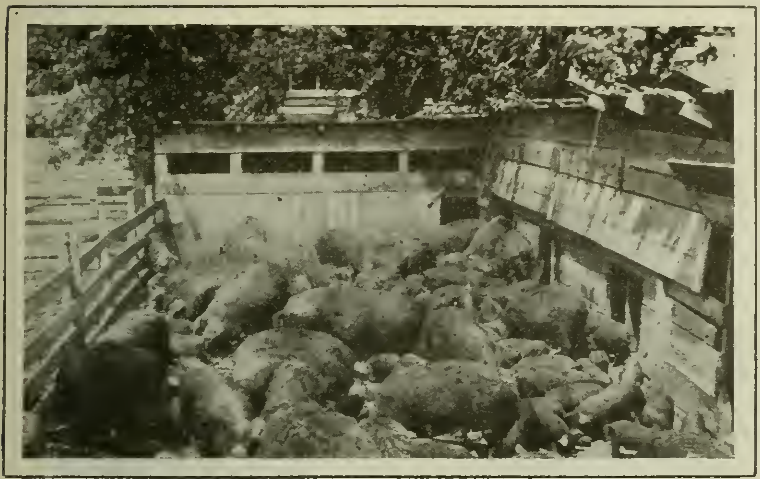
Age, about 3 years; weight, 300 pounds; breeding, scrub. Inferior breeding and poor feeding are the two chief causes of runts.

who emphasizes the value of skillful feeding advises, "Continue correct and nourishing feed until the animal is a year old and then *don't stop.*"

A comment which sums up the general sentiment on the prevention of runts comes from a Virginia stockman who says: "In 10 years of farming I have not had a runt born either of horses, cattle, or hogs. All my sires have been registered and this with good care and feeding may be the reason."

To Raise or Not to Raise Runts.

Does it pay to raise runts to market size? This question resulted in 74 per cent of negative opinions. On the other hand, 26 per cent advised raising runts under certain conditions. Such conditions involved an abundance of cheap feed, favorable markets, and especially the practicability of raising well-bred animals even if undersized. Whether to raise or



Little Pigs and Big Ones Feeding Together.

A practice which helps to cause runts. Give the young stock a fair chance to eat and exercise.

not to raise runty stock necessarily is a matter for the owner's judgment, and as a basis for such judgment a number of comments are of interest.

A hog grower who points out the value of an abundance of milk as a feed states: "I have given away runty pigs to persons who had skim milk to spare and they beat my best ones at 12 months old." Commenting on the size of pigs at birth, another breeder states that although "pigs may be small at birth, if otherwise all right they will grow as well as their larger brothers."

"In the case of inherited runtiness due to inferior breeding," an experienced stockman states, "it does not pay to raise the animal; but other cases, due to lack of proper feed, may be raised with a profit." An Ohio hog grower, in discussing runtiness due to parasites, tells of a pig which he bought as a runt for 50 cents and which weighed 287 pounds when 9 months old. In speaking of the purchase, he explained: "I thought the pig would die before I got it home. However, I took a tub of warm water and plenty of soap and an old scrub brush and gave that pig a good bath. I did this again a week later. It had a pen to itself and soon began to grow. The pig was 8 weeks old when I got it and when sold

A Litter of Ten, All Husky.

Good care of the dam before farrowing and afterwards helps to prevent undersized, unthrifty live stock.

at 9 months it weighed 287 pounds. I have tried the same methods since then with good results, but some pigs take more scrubbing than others."

A Tennessee live-stock owner states: "Well-bred runts make fairly good animals, mongrels never." One of the most striking comments is the case of a registered Aberdeen-Angus calf that was "badly stunted on account of the mother's not giving sufficient milk. But with proper care," the owner adds, "this calf did very well later. I showed him at the State fair at Helena, Mont., in 1918, and he carried off the blue ribbon in his class."

A Vermont farmer tells of a colt which at 4 months old was very poor and undersized. "I gave it skim milk for some six months," he added, "and it grew into a better built and heavier horse than either parent."

A comment which forms a general basis for deciding whether to raise a runt comes from a Virginia farmer. His conclusion is this: "Being born small generally has little effect on the size of an animal at maturity if it has proper nourishment from birth to maturity. But to develop into a high-class animal it must have good breeding back of it, and to do this we must use purebred sires that are good individuals with strong constitutions."

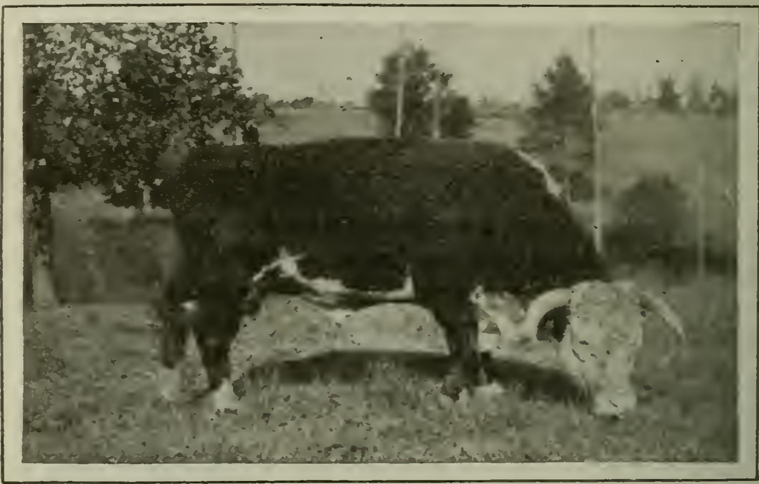
Profits in Reducing Runts.

When asked to give their opinion on the extent to which their financial returns would be increased if runts were absent, 535 live-stock owners mentioned figures varying from 1 per cent to more than 100 per cent. The average was 13.1 per cent. More than 20 per cent of those expressing an opinion reported that their returns would be increased one-fifth if they could solve the runt question. Several stockmen urged with emphasis a more liberal feeding policy on live-stock farms, and pointed out that niggardly feeding is nearly always unprofitable. "I find I can not cheat the animal without cheating myself," says a Maine farmer.

Another New England live-stock owner explains that formerly his financial loss from runts was approximately 25 per cent, "as they not only run you into debt but detract from the appearance of the good stock. In my experience of 45 years," he adds, "I am sure that any breeder can eliminate the runt to a practical absence. I have had practically none in the last 25 years."

Can Runts Be Reduced? Yes.

The reduction of the proportion of runty live stock on farms in general was considered practicable by a large majority of those expressing an opinion. However, less than three-fourths of those who had answered the various other questions made any reply as to the possibility of runt reduction, and many stated their inability to answer. Such requests as "I would like information along this line." and "If I knew how to prevent runts I would do so," explain the reasons for the partial replies. However, of 511 persons who answered the question 89 per cent believed runts could be reduced, 10 per cent more made a similar answer, with the qualification that reduction, though possible, was not always profitable. Only 1 per cent said "No." Many giving affirmative answers supported their opinions with evidence.



An Excellent Type of Sire.

Sires like this are improving the size and quality of live stock in the South. This purebred Hereford bull, used in Mississippi, weighed 1,800 pounds in good breeding condition.

A Utah farmer, in warning against the danger of inbreeding, said, "When I was a boy my father bought a bull. He kept that bull for 10 years. The calves became smaller and runty. Finally he sold the bull and got another, and every two years now we get new bulls. We have improved our stock and have no runts."

Another stockman declared, "Since going into the purebred business and having learned to feed well, I have had no runts. Previously my loss was at least one-fifth." Various sidelights on this question indicated that the presence of one or even several runty pigs in a litter was a regular occurrence and was practically unpreventable. But in contrast to this opinion some reported an ability to obtain good-sized litters in which the pigs were uniform in size, all making normal growth.

A South Carolina breeder of registered Poland-China swine states, "We have not had a runty pig in two years and some sows have from 9 to 11 pigs each. We give them good pasture on alfalfa and good range."

A Nebraska Duroc-Jersey breeder prevents runts in large litters by weaning the strongest pigs at 6 weeks old, thus giving the others a better chance. A Virginia dairyman states, "By bringing a purebred and fine, large, healthy Holstein bull into my herd the calves almost doubled in weight at birth." From Pulaski County, Va., where the "Better Sires—Better Stock" movement has made noteworthy progress, a live-stock owner writes, "Over 300 farmers in this county have pledged themselves to breed to nothing but purebred sires of any kind and have distributed good bulls over the county. In three years our cattle have improved from 50 to 75 per cent. The same can be said of sheep, hogs, and poultry. Don't breed runts and you won't have them."

Runts in Poultry.

Inbreeding and poor matings, as a cause, are the principal factors distinguishing runtiness in feathered stock from that in other farm animals. The following list of causes and methods of prevention contains the views of 474 poultry owners:

Principal causes of runts in poultry.

	Per cent.
Poor feeding	17.9
Inbreeding and poor matings	13.7
Inferior breeding stock	13.1
Parasites, especially lice	12.4
Neglect	11.4
Poor housing	7.0
Late hatching	6.5
Overcrowding	5.9
Disease (roup, diarrhea, etc.)	5.3
Low vitality of chicks	3.4
Selecting poor eggs	3.4
Total	100.0

The importance of hatching early occupies a more prominent position among the comments than the figures for late hatching in the table indicate. While but a small proportion of poultrymen, it appears, are familiar with the advantages of early hatching, those who do hatch early find it a distinct benefit. For instance, one farmer states, "Last year all of my chickens hatched after the 1st of June were runts. Those before that were normal and were laying in October. The same feed and care were given to each."

A Result of Good Breeding.

A standardbred Rhode Island Red hen, weight 6½ pounds. To obtain growthy birds that begin laying in the fall, breed well, hatch early, and feed well. In addition, provide comfortable, sanitary quarters.

Still another adds, "When I get my chicks hatched in April and May I do not have runts in my flock." Further along this line another poultryman estimates that one-third of late hatches are runty. "To prevent this," he adds, "hatch no chicks later than May 1."

Another farmer states: "I have purebred Barred Rocks and rarely ever have a runt, unless I try to hatch in June or

July." The warnings against inbreeding likewise are of interest. "We have no runts in our poultry," is the statement of a Virginia farmer, who adds, "We buy purebred cocks from a different strain every year." "Keep purebred fowls and change the sire every year," is the injunction of another poultryman, which is typical of similar experiences.

Experiments Support Breeders' Opinions.

The benefits of early hatching reported by farmers tally with the results of the experiments which the Bureau of Animal Industry has conducted. In these experiments the early-hatched chicks showed a marked superiority over those purposely hatched late to observe the effects. There was a noticeably steady degradation in size and type of the late chicks as compared with those hatched early.

With some of the larger animals early births are likewise important. The March pig if "pushed along" can be sold by Christmas time. Of course, care must be taken with early births to give better attention than if the young come after grass is good and the weather is milder. Yet, if properly cared for, the young animal will make more rapid progress at the opening of spring. There is a similar benefit with lambs. Late lambs, for example, go on the market in competition with the western run. Instead of being born early and put on the market at from 4 to 6 months of age in well-finished, plump, attractive condition, the average farm lamb is sold at from 6 to 8 months. It has lost its baby fat and is little better than a poor feeder. The effect of putting this class of lamb on the market is to reduce the popularity of lamb as a food compared with other meats, and it unquestionably injures the reputation of lamb from the farm States as compared with western lamb.

With beef cattle early calving is important on the range in order to have the calves weaned before fall storms and to have them of good size before they are sold to go to the Corn Belt for further feeding.

From these sidelights the reader will see that the questions of runtiness and of good live-stock management are closely related. Both are tied up with economic factors of great importance.

Principles of Growth.

The experiences contributed by persons cooperating with the Bureau of Animal Industry in pointing out the cause and prevention of runty live stock support certain general principles that have to do with animal growth. These principles embody also the observations of experts in animal husbandry and genetics.

Methods of dealing with runty live stock also may indicate the best course to take in dealing with unthrifty young animals in general. This matter is fully as important as that of actual runts, since the conditions that retard the growth and vigor of stock already below normal may naturally be expected to affect other animals on the farm. Here are the principles of growth to keep in mind:

1. *Every animal has in the first part of its life a natural growing period.* This varies from a few months in the case of birds (and most small creatures) to more than a year with cattle, horses, and other large animals. After the natural growing time expires, the animal's capacity for growth practically stops: hence the importance of obtaining the desired development during the early period of life, when an animal is capable of growing.

2. *Heredity is an important element in an animal's ability to grow rapidly and to reach the desired size.* Well-bred beef steers frequently attain a weight exceeding 1,000 pounds within 18 months, whereas scrubs of light-weight ancestry can not be expected ever to reach 1,000 pounds in weight, even though given the same feed and care. The same natural laws that cause a turkey to grow larger than a chicken affect the size of individuals in the same species and even the same class or variety.

3. *Interference with the nervous system and the vital organs is a serious drain on the vitality of an animal.* Hogs infested with lice, for instance, make poorer gains than those free from such parasites. A heifer bred before reaching maturity may be permanently stunted by the extra demands of the young calf on her system. There is an exception, however, in the effect of castration on growth. A capon grows more rapidly and reaches greater size than a rooster, and with

most meat animals skillful castration appears to increase rather than retard growth.

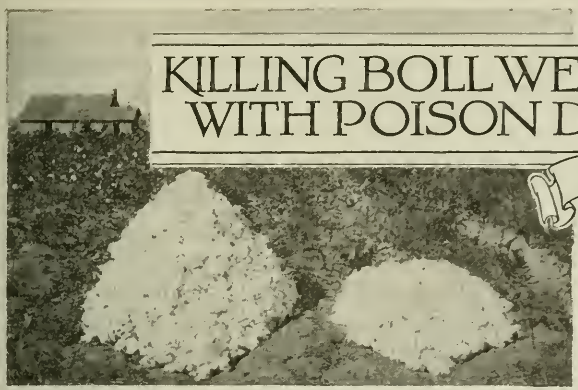
4. *Nutrition, of course, is a prime factor in the question of runty live stock.* The proper nutrition of young stock begins with the feeding of the pregnant mother. After the animal is born its proper nutrition involves not only the quantity of feed, but likewise the palatability, quality, and proper combination. There must be no interruption of feeding, since periods of semistarvation, most common in winter, may prevent an animal from reaching its normal size. The question of feeding live stock includes the very important matter of watering.

5. *Fatigue, exposure, and overcrowding may retard growth.* Physical deformity and certain mental factors, such as timidity or sluggishness, likewise may interfere with the ability of an animal to obtain the necessary feed, especially in competition with other stock that is normal, alert, and aggressive.

STOP PRODUCING RUNTS

Runts are usually the result of—
- Inferior breeding
- Inadequate or unsuitable feed
- Disease, parasites, and insect pests
- Lack of adequate housing and care

To prevent runts—
- Use quality stock for breeding
- Feed well with suitable feed, especially during the natural growing period of early life
- Guard against parasites and diseases
- Provide comfortable and sanitary housing
- Give proper attention, care, and kindness



KILLING BOLL WEEVILS WITH POISON DUST

By. B. R. Coad,
Entomologist, Southern Field Crop Investigations,
Bureau of Entomology.

CAN the cotton boll weevil be controlled profitably? If you are a cotton raiser there is hardly anything you would rather know. An affirmative answer to the question, eagerly sought ever since the weevil invaded this country, has at last been found. The weevil can be controlled by means of a calcium arsenate dust, if the dust is applied at the right season, at the right intervals, and in the right way. This may sound hard, but it isn't. All it means is that the job must be done right. It is no good to build a house and leave the roof off; if you are not going to make a complete job, it will not pay to start.

The method now recommended by the Department of Agriculture for poisoning the weevils is the outgrowth of a long series of experiments. The first announcement of success in weevil poisoning was made by Prof. Wilmon Newell and Mr. G. D. Smith as a result of experiments conducted with powdered lead arsenate in Louisiana during the season of 1908. The farmers, however, did not adopt this method, and experiments conducted by the Department of Agriculture during the next few years gave such variable results that definite recommendations could not be made regarding it. But as a result of technical experiments by the author in 1913–14, the problem was attacked from a new angle; in new field tests the poison used and the methods of application were changed, and striking results were obtained. More exhaustive studies followed these experiments, and it was found possible by poisoning to reduce the number of weevils sufficiently to keep them under control. It was also found, however, that this control usually did not last long after the poisoning was stopped, and, furthermore, that the weevils were merely reduced in number—never exterminated. Applications of poison made early in the season, with the view of killing the hibernated individuals and thus preventing their multiplication, were not profitable, and far better results were obtained by poisoning later in the season. Apparently enough weevils survived the early-season treatment to keep up the infestation. The poisoning period was therefore deferred to a time, later in the season, when the plants are fruiting more heavily and are better able to take advantage of a short period of protection.

Free Fruiting of Cotton Favors Poisoning.

The cotton plant puts on much more fruit than it can mature, and about 60 per cent of the squares which are put on are shed. This shedding varies as the plant develops, starting with a fairly light shed early in the season and increasing until it reaches the point where all new fruit is shed. Up to a certain point, shedding due to boll-weevil injury merely takes the place of this natural shedding, and thus a certain amount of weevil activity can be permitted without any loss of crop.

With these facts in view, the poisoning of the weevils is begun just before they become abundant enough to offset this natural shedding of the plant, and is continued long enough for the cotton plants to put on a crop of bolls and develop them beyond the danger of weevil injury. Then poisoning is stopped and the weevils are allowed to multiply unchecked.

The most serious obstacle to bringing about the general adoption of such a system of poisoning is the difficulty of giving explicit instructions regarding the best time for starting and for stopping poisoning. Arbitrary rules can not be established. Conditions vary from field to field and from season to season. Probably it will never be possible to give instructions for poisoning which will not leave much to the discretion of the individual; but continued use and the adoption of local practices which most nearly fit local conditions will overcome this drawback in a measure.

Increasing Success with Dusting.

The fact having been established that weevil control was possible, it became necessary to make it both profitable and practicable under farming conditions. This has meant development of the methods of dusting and improvement of the material utilized.

From 1915 until 1917 the department's experiments consisted entirely of small-plat tests of different methods of poisoning, the results in each case being ascertained by careful comparison with those in plats of unpoisoned cotton. These experiments resulted in rapid improvement in dusting methods until uniform gains of from 250 to 1,000 pounds of seed cotton per acre were obtained from the tests.

The first really practical work on an extensive scale was undertaken in 1917, when several hundred acres of cotton on one plantation were poisoned late in the season with profitable results. This experience led several owners of large cotton plantations to undertake poisoning work on their entire properties in 1918, the work being supervised by experts of the Department of Agriculture. During that season about 35,000 acres were included in the experimental work, and the results on the whole were profitable.

Following the success of 1918, the department issued its first publication on poisoning, which aroused interest among the farmers in several localities. As a result some 3,000,000 pounds of poison were used for weevil control during the summer of 1919, the work of the department during that season involving about 75,000 acres. Again results were favorable and interest in the poisoning spread rapidly among cotton growers.

Dust Every Four Days.

In the earlier work poison was applied every seven days, but it has since been determined that an interval of approximately four days is much better. As the primary aim in poisoning is to keep the cotton thoroughly poisoned from the first application until the weevils are under control, weathering and plant growth make it necessary to repeat the applications about every four days. The poison reaches only the adult weevil and has no effect on the immature stages, protected as these are within the squares and bolls. These would produce weevils daily for about two weeks after the first application was made, even if no eggs were laid after the first application. When the applications are seven days apart a sufficient number of weevils emerge, escape poisoning, and lay their eggs to perpetuate the infestation; but by keeping the

Cart Duster in Operation in Cotton Field.

This machine will cover about 25 to 30 acres during a night's operation and can be allotted from 75 to 100 acres of cotton for the season.

cotton continuously poisoned it is possible not only to kill the adults present when the first application is made but also to destroy the majority of their progeny.

It is generally found in the field that about three applications at the short-time interval of four days will reduce the number of weevils below the point of danger.

Raise a Cloud of Dust, and Let It Settle.

Any attempt to blow the poison directly onto all portions of the cotton plant is out of the question. Fortunately, however, this is neither necessary nor desirable. Technical studies indicate that most of the weevils are poisoned not through their feeding but through their habit of drinking moisture from the surface of the plant. Therefore the weevils will be killed if the fine powder is caused to settle on all portions of the cotton plant that may retain moisture, and this is accomplished by the dust-cloud method of application. The poison is blown out in such a manner as to form a dense cloud of dust, which drifts through the plant and covers all exposed surfaces.

Night Applications Best.

Practically all poisoning work must be done at night. The plants are unusually moist at this time and thus retain the poison better; furthermore, atmospheric conditions at night are such that the dust cloud will remain over the plants and settle upon them, whereas during the day it is likely to rise above them and drift away. On occasional days, of course, the plants are moist and the air is calm, but as a rule satisfactory dusting conditions occur only at night.

Use Calcium Arsenate.

At the outset of the work powdered arsenate of lead was utilized for poisoning. As the grades of this arsenical which were then standard did not give the requisite degree of weevil control, an improved grade was prepared. This gave fair results, but it was still not thoroughly satisfactory.

Calcium arsenate was then tried and was found to be far more poisonous to the weevil than any form of lead arsenate, a better material for dusting, and far cheaper. The calcium arsenate first used, however, burned the cotton plants seriously, owing to the presence of too much water-soluble arsenic oxid. Improved methods of manufacture have eliminated this difficulty. Calcium arsenate containing different proportions of total arsenic were tested, and it was found that the product containing from 40 to 42 per cent total arsenic pentoxid gave very satisfactory weevil control and could be made so as not to contain too much water-soluble arsenic.

It is important that the material have the right physical properties, especially those which make possible the best dust cloud with the least possible material. Eventually a material bulking 80 to 100 cubic inches per pound was selected as most satisfactory for this work.

Getting a Good Dust.

Prior to 1918 only one manufacturer was producing calcium arsenate, and this in very limited quantities. In 1919 about a dozen more manufacturers undertook its production, and in 1920 the number was increased to at least 25. Unfortunately, calcium arsenate proved not so easy to manufacture as was anticipated; and with so many new producers making it the quality of the product was naturally exceedingly variable, especially since it might be unsuitable in three different ways: First, it might contain too much water-soluble arsenic and thus injure the cotton plant; second, it might not contain sufficient total arsenic to control the weevil; third, the physical properties might be such that it could not be satisfactorily dusted on the cotton plant.

To give the farmers as much protection as possible, all purchasers of calcium arsenate have been invited to send samples to the department, at Tallulah, La., for analysis. More than 2,000 samples have been analyzed, and the farmers have been advised as to whether their material was satisfactory for use for boll-weevil control. In addition, the Federal Insecticide and Fungicide Board has devoted considerable attention to sampling the larger shipments of calcium arsenate, and wherever these have been found to be made up of unsuitable material they have been seized and condemned. On the whole, this has resulted in a fairly thorough degree of protection to the farmers, and much calcium arsenate which could not have been used safely has been eliminated from the market, although on several occasions unsatisfactory material was used before it was possible to detect it. It is hoped that this difficulty will soon cease to exist, and the improved quality of the material sold during the latter part of the season of 1920 indicates that the majority of the manufacturers have now had sufficient experience in the making of this chemical to turn out a very satisfactory product. Owing to the rapid development of this industry, however, the material on the market still requires careful inspection.

Dusting Machines.

Suitable machinery for dusting is highly important. The original plat tests were conducted with hand "guns," but as soon as practical control work was started it became necessary to have equipment of larger capacity. The first machines used were adaptations of types then on the market, but it was soon found that they were unsatisfactory and it became necessary for the department to organize a mechanical branch. This was done by the Bureau of Entomology and the Division of Rural Engineering of the Bureau of Public Roads working together.

On account of the large area under treatment at that time, the first machine developed was a gasoline-power duster. Gas engines proved unsatisfactory, however, owing to night operation and the quality of labor available for running these machines. Another difficulty at that time lay in the feeding of these machines, for it was found impossible to dust an acre of cotton with less than about 15 pounds of material. Improved feeding devices were therefore developed, capable of delivering any desired quantity of material per acre, and thus permitting the use of the desirable dosage of 5 to 7 pounds per acre.

To avoid the use of the gas engine, experimental models of machines which derive their power from the wheels were built and found to be very satisfactory. Blue prints showing all details of construction of a machine of this type were furnished all interested manufacturers. As a result several hundred machines of this type were distributed during 1920, and at present a half dozen or more manufacturers are building machines based on this design.

Hand guns, on the whole, have proved decidedly unsuited to extensive weevil-poisoning work. Notwithstanding every effort to improve existing models, the hand gun has two great drawbacks—laboriousness of operation and lack of durability. Of course such machines will always be of use on very small areas or where, owing to stumps, roughness of ground, or other conditions, the operation of a larger machine is impossible.

Following the development of the cart duster, the need of a smaller and cheaper machine became very apparent, and during the 1920 season the department worked on the development of a one-mule type of machine which will meet the needs of small farmers. It is expected that this machine will be comparatively cheap and will dust about 50 acres of cotton during the season. Experimental models of such a machine have proved satisfactory, and several manufacturers are becoming interested in its construction for the 1921 season.

In addition to these standard types of machines, several other models are now being developed. For example, at the suggestion of the department some manufacturers have undertaken the construction of a two-row machine to be carried on mule back. Other designs include machines modeled somewhat on the order of the hand gun but carried by two men; and still others will undoubtedly be forthcoming soon, as is desirable.

All machines designed and developed by the department engineers have been covered by patents dedicated to the public. These designs are then available for any manufacturer or individual who cares to utilize them.

The mechanics of the department have also served in an advisory capacity for manufacturers engaged in the production of dusting machines and have assisted in every way possible in making these designs satisfactory. In the same manner the farmers have been assisted by advice regarding the best type of machines for the conditions under which each man is trying to poison.

Poisoning Schedules for Each Locality.

In the interest of the best experimental work, all the earlier experiments were conducted in one district, the Mississippi Delta. This was unfortunate in a way, for although detailed information could be given regarding the poisoning methods best adapted to that district, these methods do not necessarily apply in other localities. The work has therefore been extended as rapidly as possible and substations established in many representative districts throughout the cotton belt. The simultaneous collection of data at many points, at each of which conditions differ radically from those elsewhere, will permit the preparation of schedules for poisoning more nearly adapted to each locality. At each of these stations plat tests of weevil control were conducted during the 1920 season, largely with the view of determining the margin of profit for operation at these different points. It is already apparent that profitable gains from poisoning may be looked for in the Alabama black belt, southern Louisiana, eastern Georgia, and southern South Carolina.

Yields of Poisoned and Unpoisoned Cotton.

Above: Dividing line between poisoned and unpoisoned cotton in check-plat work conducted near Tallulah, La., during the season of 1920. Neither plat has been picked. The poisoned plat produced over 500 pounds of seed cotton per acre more than the unpoisoned plat.

Below: Piles of cotton showing difference between yield of poisoned and unpoisoned cotton in commercial poisoning work in the Mississippi Delta during 1920. This farmer left 3 acres of a 10-acre cut unpoisoned, and the piles were picked from a quarter acre each of the poisoned and unpoisoned cotton. The increase of seed cotton per acre due to poisoning was over 900 pounds.

Success and Failure in 1920.

The large-scale poisoning work under the supervision of the department was still further extended during the season of 1920, especially to embrace additional districts. Seasonal conditions made the experiments of that year particularly interesting. The mild winter of 1919–20 permitted the emergence of an unusually large crop of hibernated weevils in the spring of 1920. Following this, the excessive and frequent rains which were almost universal caused a rapid multiplication of weevils. In addition, the spring of 1920 was so unfavorable to planting that the cotton crop was from two to four weeks late. These conditions combined produced an unusually heavy damage by the weevil, probably the heaviest in the history of its activity in this country, a fact which gave large margins for gains from the poisoning work, though this advantage was more or less offset by the difficulty of operation in the face of the almost incessant rains. On the whole, the conditions were decidedly against poisoning, yet the gains from poisoning were more general than ever before, and these gains as a rule were larger than usual.

During this season 10,000,000 or more pounds of calcium arsenate was sold for cotton dusting. Evidently a large number of farmers attempted poisoning. Their operations extended from southern Texas to South Carolina, but only in separate localities or sections, poisoning being a recent development and still unknown to a majority of the cotton farmers.

Early in the season it became apparent that the suitable dusting machines would fall far short of the number required. As a result many farmers bought calcium arsenate with little or no likelihood of being able to obtain machines for applying it. Furthermore the shortage of other machines gave a great opening for the sale of hand guns, which were available in rather large numbers. The only types of machines to be had were the hand guns and the large cart dusters. The latter were selling at from $300 to $500 and were therefore out of reach of the farmer who planted less than 100 acres of cotton; consequently many farmers tried hand guns on entirely too large a scale. Not more than

8 acres of cotton can be treated throughout the season with a hand gun. Furthermore, owing to the inadequate supply of labor and the reluctance of plantation hands to operate these guns for any length of time, it is ordinarily impracticable to use them on more than 25 acres in one organization. In spite of this, many farmers purchased one hand gun for 40 acres or more of cotton, and in other cases several hand guns were purchased for very large areas. Naturally, many failures resulted.

A survey has been made to determine the degree of success attained by the farmers in the different districts, and also to determine the cause of the failures. The results are interesting. In many districts success was general, in some a few individuals succeeded while the rest failed, and in others weevil poisoning was almost invariably a failure.

Reasons for Failure.

A careful scrutiny of the methods of application used showed that an unfortunately large number of farmers had in no way approximated the recommended methods. In many cases they had applied the poison only once, in others they had tried two applications from a fortnight to a month apart. Other farmers, with hand guns, attempted to dust areas so large that it was impossible to cover them, and so gave it up in disgust. The one saving feature of the situation was that in practically every case in which recommended methods of application were used the results were at least fairly satisfactory.

The failure of many farmers to follow the proper method in dusting seems to have been due usually to lack of information, or at least to lack of correct information. Poisoning, when done as recommended, is an expensive operation, but some salesmen have tended to minimize its cost and its difficulties. For instance, if the salesman had an idea that the farmer would not try poisoning if told that it would be necessary for him to make three or more applications, he would affirm that one application would control the weevil. If the farmer showed disinclination to buy more than one hand gun he was often informed that this would quite suffice for treating whatever area he had in cotton, whether 10 acres or 50 acres.

These conditions, of course, will be remedied rapidly, but unfortunately they have served unwarrantably to discourage many men and undoubtedly have led to a number of losses. Fortunately the smaller machine adapted for the small farmer will be available for use in a short time, so that it will no longer be necessary for him to depend upon hand guns.

Many failures were evidently caused by the use of unsuitable calcium arsenate. In some cases the total arsenic content was so low that it would not kill enough weevils to secure control. Furthermore, a considerable quantity of calcium arsenate sold to the farmers was sandy or granular, not ground finely enough, so that instead of drifting through and remaining on the cotton plants it failed to adhere and fell to the ground. With such material it was almost impossible to secure any weevil control.

One important cause of failure is carelessness of operation. All publications on weevil poisoning have thoroughly explained the fact that the operation is useless unless thoroughly done; and since the method is so entirely new to the laborer, it is futile to hope for satisfactory results from equipment turned over to tenants for operation without any instruction or supervision.

Some farmers, having made one or two applications of poison on the cotton and, upon examination, finding live weevils still present, have become discouraged, inferring that the work was useless, and have discontinued it. No matter how poisoning is conducted, it is always possible to find live weevils in the field, and their presence in no way precludes obtaining a full crop of cotton and a very good profit from the poisoning operations.

Do it Right or Not at All.

To recapitulate, the results of poisoning in 1920 were exceedingly variable. While there were many failures, there were many more successes, and on the whole the experience of the season showed more plainly than ever that it is possible to control the weevil if the work is done properly. It emphasizes the repeated advice of the department, "*Do it right or not at all.*"

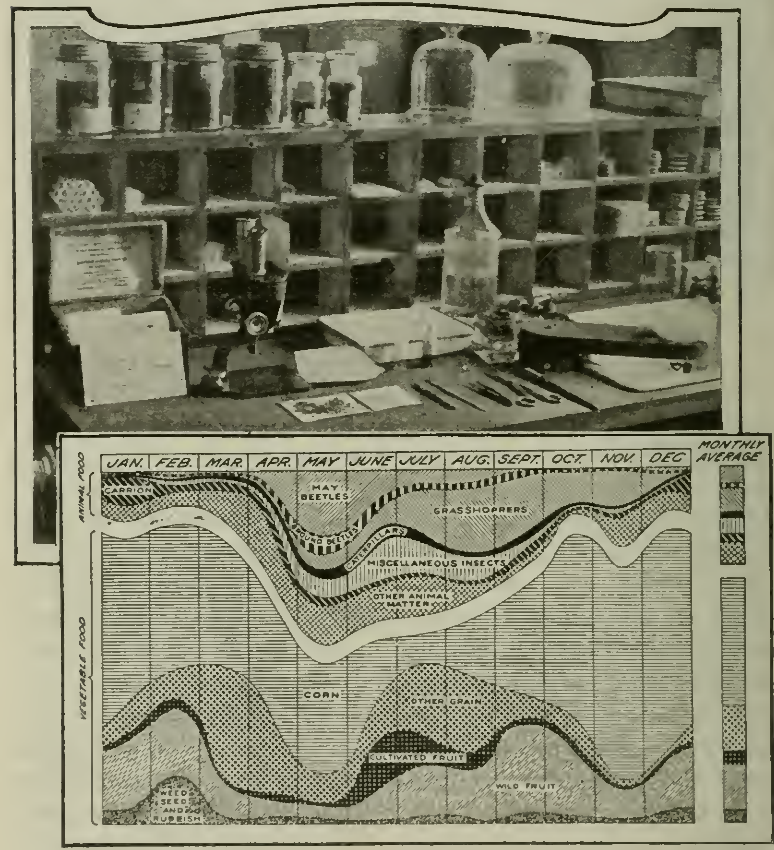
Gulls following plow picking up alfalfa weevils

FARM HELP *from the* BIRDS

By W. L. McAtee,
Assistant Biologist in Economic Ornithology,
Bureau of Biological Survey.

BIRDS hunting insects and worms in an orchard may not buzz so much as the proverbial bee, but just the same they are mighty busy. One who has seen them at it during the season when they are rearing their young can have no doubt about their being a great help to the orchardist. They are active everywhere: flickers, blackbirds, robins, and thrashers seek their insect prey on or near the ground; woodpeckers, nuthatches, titmice, and chickadees closely search the trunks and limbs of trees; vireos and warblers scan the leaves and probe the flowers; and flycatchers and swallows sweep their prey from the air itself. Every few minutes all day long the hungry young must be fed; and that they are well fed their rapid growth attests. The quantity of insects they and their parents consume is enormous. Not only orchards benefit by the good work of birds, but gardens, berry patches, and plowed and newly sown fields as well. While fields actually grown to tall crops are less freely visited, all crops are helped to some extent, and practically every farm pest has its bird enemies.

To learn exactly how and to what extent birds are aids to agriculture, horticulture, and forestry, the Biological Survey has been making a scientific study of their food habits ever since its establishment in 1885. Its investigations are carried on in both the field and laboratory. All that can be learned out of doors by direct observation and by study of the avail-



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How the Feeding Habits of Birds are Studied.

The stomach content, the tale of what the bird eats, is analyzed under the binocular microscope in the laboratory, other equipment of which includes stomach-analysis cards, filter, dissecting instruments, containers, and other paraphernalia as shown in the upper picture. From the 80,000 cards now on file in the Biological Survey, each representing the analysis of one bird stomach, it is possible to chart the food of any species investigated. The lower picture is such a chart of the monthly and average annual food of the common crow. The relative proportions are seen at a glance.

able food supply is valuable, but there is a surer way of finding out what a bird eats, namely, to look into its stomach. It has been repeatedly demonstrated that the nature of the food and feeding habits of birds is such that it is impossible to arrive at definite results by direct observation. On the other hand, the examination in the laboratory of the contents of the stomach gives information that is definite, exact, and indisputable.

In the laboratory of the Biological Survey, the method of examining the stomach content of a bird consists of washing all material into a white-lined tray, separating the larger particles on white blotters, catching the more finely ground food on a bolting cloth, transferring this to blotters, and finally identifying the component parts of the whole under a microscope. Identification is facilitated by comparison with collections of seeds, fruits, insects, snails, and bones of birds, mammals, reptiles, and amphibians, in fact of all classes of objects eaten by birds. A card prepared for each stomach contains a full inventory of food items and their relative percentages by bulk, and when a sufficient number of these index cards have been accumulated for any species of bird, the percentages of the principal items of food for each month are calculated, and the average for the season or year is taken. These are the figures quoted in official reports on the food of birds.

From the percentages and the economic value of the food items, the utility of a bird can be closely estimated. The Biological Survey is then able to recommend how it should be treated. Exhaustive accounts of the economic relations of more than 200 species of American birds have been published by the Survey, and some description given of the status of no fewer than 500 species.

In the United States are found more than 800 distinct kinds of birds of 69 families, of which 20 families are classed as waterfowl, 7 as shorebirds, 4 as upland game birds, 5 as birds of prey, and 33 as land birds. In general, the smaller land birds are of greatest interest to the farmer and orchardist. Of the larger birds, however, the upland game birds, the hawks, and the owls deserve notice.

Upland Game Birds.

The upland game birds comprise such familiar groups as the quail, grouse, ptarmigan, wild turkeys, wild pigeons, and doves. The last two, while usually harmless, sometimes damage crops to an extent which requires that they be controlled, and economically they deserve less consideration than the turkey, quail, and grouse. These three kinds of birds have feeding habits which are helpful to agriculture. They may be hunted, but their numbers should not be reduced below the normal population for each type of country.

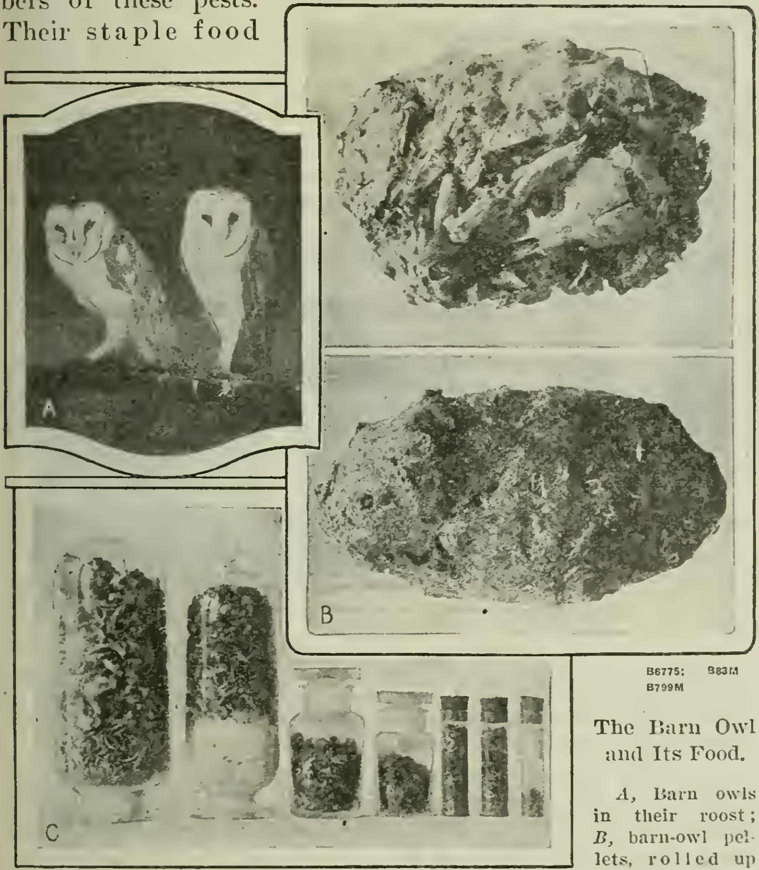
Birds of Prey.

The birds of prey include the carrion-feeding vultures, the fiercely rapacious hawks and eagles, the fish-loving osprey, and owls of various habits. The vultures, of which our familiar black and turkey buzzards are examples, are carrion feeders and will disappear from communities where all offal is properly disposed of, but in some localities they have still plenty of work to do. The charge that they are instrumental in distributing hog cholera and other live-stock diseases is based chiefly on suspicion. It is not true that they disseminate the germs of these diseases in their droppings, and the fact seems to be that buzzards, if a factor in spreading stock ills, are a minor one.

Hawks and owls, though not closely related, may be considered together on account of the similarity of their feeding habits. Feeding chiefly upon living animals smaller than themselves, naturally they sometimes prey upon some of the domesticated kinds, particularly poultry. This has given them a bad reputation with farmers, so long established as to amount to traditional prejudice. Scientific investigation of their habits shows that only a few species of hawks and only one owl feed chiefly, or even largely, upon birds, and therefore to any great extent upon poultry. The birds of prey regarded as chiefly injurious include the sharp-shinned, Cooper, and duck hawks, the goshawk, and the great horned owl. The bird hawks fly swiftly over trees and bushes and make sudden darts upon their prey, and from this behavior and their color, three of the species are often known as blue darters. The chiefly beneficial hawks differ in flight from the darting hawks, either soaring at a considerable height or hovering over places where they are seeking prey. The great horned owl, which, like most of its relatives, feeds at night, gets only poultry that is improperly exposed, and when prevented from doing this, its habits are largely beneficial.

Useful Hawks and Owls.

The remaining species of hawks and owls, more than 50 in all, have useful habits. They feed on a great variety of rodents and have a tremendous effect in controlling the numbers of these pests. Their staple food



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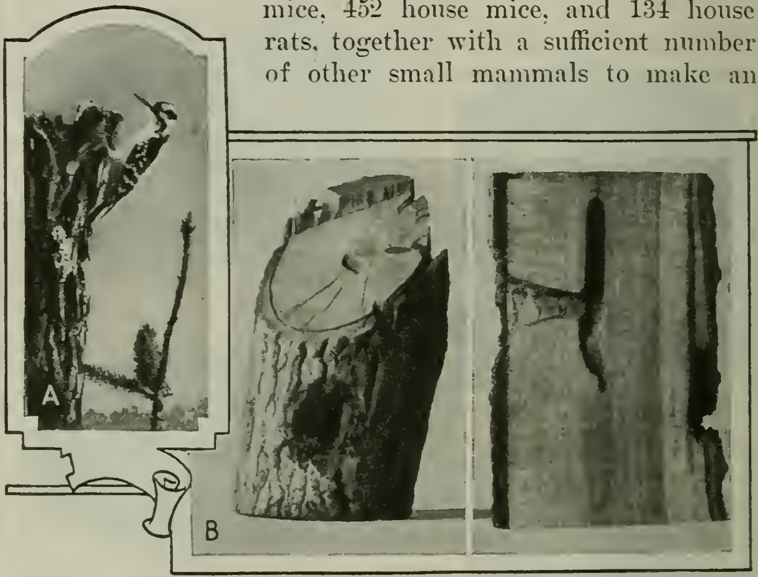
The Barn Owl and Its Food.

A, Barn owls in their roost; *B*, barn-owl pellets, rolled up from the indigestible portion of the food and ejected; *C*, contents of 592 pellets investigated—1,058 skulls of pocket gophers, rats, and mice. Most owls are valuable aids to the farmer in their destruction of numerous harmful small animals.

consists for the most part of meadow mice, but it includes also many other destructive rodents, such as rabbits, ground squirrels, prairie dogs, pocket gophers, and house rats and mice. The barn owl is one of the most useful of the birds of this group. Its food is easily studied by examination of the pellets, made of the hair and bones of its victims, which accumulate about its roost. These indigestibles are ejected habitually by all birds of prey, but are scattered too widely for collection and study except by species having restricted roosting sites. In 675 barn-owl pellets collected in Washington, D. C., were found the remains of 1,119 meadow mice, 452 house mice, and 134 house rats, together with a sufficient number of other small mammals to make an



The Woodpecker and Its Helpful Work.

A, Hairy woodpecker, one of the 24 species of birds of this large family, most of which are highly beneficial (photo by C. F. Stone); *B*, example of work of woodpeckers—their bills are specially fitted to dig out wood-boring larvæ from deep in the trees.

average of almost three to the pellet, and probably to the meal. In 592 pellets collected in California there were found skulls and other traces of 261 pocket gophers, 74 field mice, 184 pocket mice, 144 deer mice, 50 harvest mice, 230 kangaroo rats, and 215 house mice. These items make it clear that the barn owl is constantly doing work of great value to agriculture. Its services are typical of those of hawks and owls in general. Owls as a group have long been persecuted by man, but never has persecution been more unjust. The hawks and owls are not the only sufferers, however, for when their numbers are greatly reduced in any community, farmers will be forcibly reminded of the fact by a great increase in the number of destructive rodents.

Cuckoos and Woodpeckers.

While many of the birds of prey, game birds, and wild fowl have distinct economic value, we must turn to the characteristic land birds to find whole families that are almost uniformly beneficial and for large numbers of species practically perfect from the economic point of view. Among the most praiseworthy birds are the cuckoos. The most widely distributed species, the yellow-billed and black-billed cuckoos, usually keep out of sight, but are well known by their strange notes, which have earned them the name "rain crow." The cuckoos feed very largely on caterpillars, and subsist to a larger extent than most of our birds on the hairy and spiny kinds. One stomach contained 250 tent caterpillars and another 217 fall web-worms. The cuckoos are fond also of grasshoppers, sawfly larvæ, plant bugs, and other injurious insects.

The large and important woodpecker family includes 24 species in the United States, most of them highly beneficial. They are the chief defenders of trees against insect attack, most of them being specialized to feed upon wood-boring larvæ, pests preyed upon by few other birds. From a third to two-thirds of the entire food of several species consists of wood-boring insects. From 10 to 80 per cent of the annual diet of various species is made up of ants, which are almost uniformly injurious. The flickers, or "yellow-hammers," especially are assiduous destroyers of ants, one of these birds being known to have taken more than 5,000 at a single meal.

Nighthawks and Hummingbirds.

A group of birds, which, though diverse in appearance, are related in essential characters, includes the chuck-will's-widows, whip-poor-wills, poor-wills, nighthawks, swifts, and hummingbirds. All are almost strictly insect eaters and consequently beneficial. The larger ones feed extensively upon leaf-chafers, the larvæ of which, including the well-known white grubs, are very destructive. The nighthawks take considerable of the same sort of food, but, in common with the swifts, capture a great variety of small insects, more than 50 different kinds having been found in single stomachs, represented in some cases by thousands of individuals. The hummingbirds devour minute insects which they find in flowers or catch on the wing, and do not subsist to so large an extent as ordinarily supposed upon the nectar of flowers.

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The Nighthawk, an Extremely Valuable Insect Destroyer.

This bird, often wantonly shot, scoops its prey out of the air, and more than 50 different kinds of insects, representing thousands of individuals, have been found in single stomachs. (Photograph by Lewis F. Hall.)

Flycatchers.

One of our families of birds gets its popular name "flycatcher" from the insect-eating nature of its species, 31 of which live in the United States, including such birds as the spectacular scissor-tail, the bold, dashing kingbird, and the more quiet and domestic phoebe. On the average, 95 per cent of the food of these birds has been found to consist of insects. The rose-chafer, a species not only destructive to vegetation, but known to be poisonous to chickens and pheasants, is freely eaten by the kingbird. Several flycatchers have the reputation of eating hive bees to an injurious extent, but it has been shown that they take mostly drones, and furthermore, that they eat enough enemies of bees, as robberflies, to pay for all the domestic bees they take.

Jays, Crows, and Ravens.

The jays, crows, and ravens have always been severely criticized, and it must be admitted that on the whole the criticism is justified. About the best that can be said for birds of this family is that on the average they do about as much good as harm. It would seem a good policy to accord them the same treatment long given the common crow—the crow is not especially persecuted, neither is it protected. Thus while the birds are allowed to exist in reasonable numbers for the sake of the good they do, the way is left open for aggressive measures against them when necessary. In the case of this family, as of all destructive birds, damage usually is the result of overabundance.

Blackbirds.

The damage done by the blackbirds is conspicuously the result of over-population. One of the most characteristic habits of these birds is flocking, and some of their gatherings are enormous. In their winter home along the Gulf coast flocks of blackbirds at a distance look like great clouds or rolling balls of dense smoke. Fortunately, at the time these birds are assembled in these armies there is nothing for them to damage, and their flocks are much smaller at the season when grain from the milk stage to maturity is exposed to their attack. Nevertheless, the damage sometimes is serious, and protection of these species is not recommended. In the same family with the blackbirds, however, are such birds as orioles and meadowlarks, and these do much more good than harm.

Sparrows.

The great sparrow family, comprising almost a hundred species in the United States, as a whole shows a good economic record. The introduced English sparrow, usually a nuisance and often injurious, is, it must be remembered, but one of this large family, and its habits are by no means characteristic of the native species. The sparrows, or finches, are essentially seed eaters, but they consume also a fair proportion of insects, and in general must be regarded as beneficial. Certain species at times take too many buds, and a few others occasionally damage grain, but these practices are exceptions which may be met by local control.

Other Insect Eaters.

The tanagers and swallows are almost exclusively beneficial, the latter especially being tireless destroyers of a great variety of insects. They course systematically over

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Caring for the Brood.

Upper view, robin on nest—a bird universally known and almost everywhere beloved, sometimes too attentive to cultivated fruits. (Photograph by F. A. Kinsey.) Lower view, tree swallow at nest box, bringing a cranberry moth to its young (photograph by E. H. Forbush); swallows are tireless destroyers of a great variety of injurious insects.

fields and gardens, over land and water, and gather up untold numbers of the small pests that are a constant menace to our comfort and prosperity.

If soft plumage and harmonious colors were the criteria of bird worth, the cedar waxwing would stand near the top. Economically, however, it is in the doubtful, even the very doubtful, class. It is too fond of flowers, buds, and fruits, especially cherries, and it consorts in such large flocks while gratifying these tastes that the interests of mankind suffer considerably.

The butcher birds, or shrikes, which have the curious habit of hanging part of their prey upon thorns, in crotches, or in other suitable places, destroy some other birds, but on the whole are beneficial.

About 10 kinds of the smooth green-coated vireos and 55 kinds of warblers of varied and brilliant but neat plumages constitute the especial guardians of the foliage of our trees. All day long these little birds are scanning twig and branch and limb, snapping up the caterpillars, scale insects, plant lice, and the like, which collectively are so great a drain upon the vitality of arboreal vegetation. There are millions of warblers and vireos in North America, and the aggregate destruction of insects by them is beyond conception.

Allied in service to the warblers are the bark-climbing creepers, the industrious and inquisitive nuthatches, the restless and active chickadees and titmice, and the tree-scanning kinglets and gnatcatchers, of which groups there are in the United States more than 25 species. They either pursue their prey chiefly among foliage, as do the warblers, or supplement this work by seeking insects on the bark of trees and in crevices and cavities everywhere. Some of the smaller of these birds are especially meritorious for their destruction of the eggs of insects.

Mockingbirds, catbirds, and thrashers are distinguished by unusual ability as songsters. Economically considered, all are rather too fond of cultivated fruits, but as a rule they do more good than harm, and experience shows that despite the damage they inflict these birds are usually desired in the vicinity of homes and even invited there for the sake of their songs.

Closely related to the mockers and thrashers are the wrens, of which we have 11 species. These little birds are incessantly active, tireless, and good singers, almost wholly insectivorous, and consequently beneficial to a high degree. About the only complaint made against them is that the familiar house wren interferes with the nests and eggs of other birds.

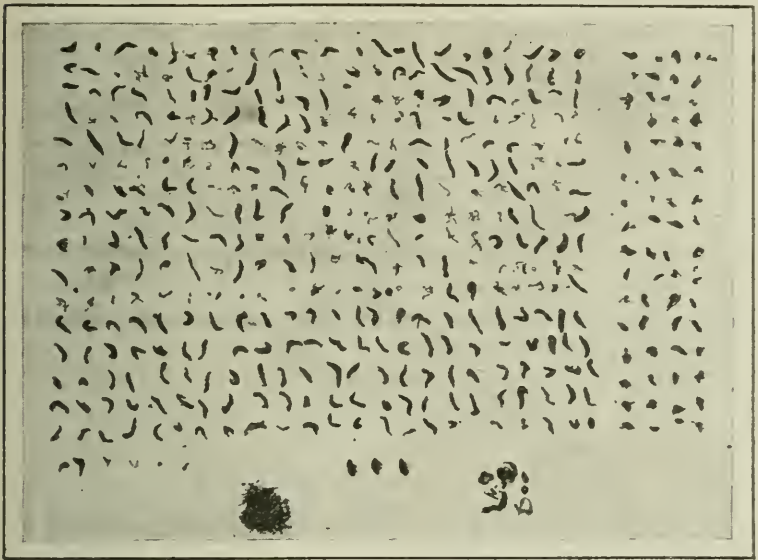
Only one family of small land birds remains to be mentioned, namely, that including the thrushes, robins, and bluebirds. The thrushes are characteristic woodland species, and while not of great economic importance are for the most part commendable in their relation to man. Robins and bluebirds are the most familiar species about our homes, and so beloved are they that they are almost immune from persecution. The bluebirds strictly deserve this high consideration, but the robins take a large toll from cultivated fruits, and probably are too numerous in many localities.

Combined Attacks on Insect Pests.

To understand the economic value of birds, not only must the feeding habits of species and families be known, but also the collective effect of birds upon pests and crops. Most of their damage results from local over-abundance either of one species or of a number of species of similar feeding habits, and it is inflicted chiefly upon fruit and grain crops. The produce of small numbers of fruit trees especially is liable to severe damage where there is an abundance of fruit-eating birds. In orchards of commercial size damage is less often noticed. Preventive measures are of some avail; but aggressive action is sometimes necessary against birds that persistently destroy fruit crops or grain. Grain fields are not often severely damaged by birds under modern conditions, except on lands near breeding grounds of bird colonies, populous roosts, or in the migration route of gregarious species. The blackbirds are the most notorious offenders in this respect, and flocks of them at times are so large that it seems there must be a blackbird for every plant in the grain field.

If birds by their united effort are potent to accomplish great harm, they are for the same reason able to do great good in the destruction of insect pests. Fortunately, many more species are helpful than harmful. Unusual outbreaks of pests upon which birds can feed are always attended by gatherings of the bird clans. In no instance has this been more evident than in the field-mouse plague which occurred in the Humboldt River region, Nevada, in 1907–8, during which the damage to crops was placed at $250,000 in a season. Gulls, hawks, and owls flocked to the scene, and all birds able to live upon mice practically took no other food. The birds, it was estimated, destroyed about 900,000 of these field mice each month.

The way in which birds concentrate when an outbreak of an injurious insect occurs is illustrated in the case of the alfalfa weevil, a destructive pest accidentally introduced into the region about Great Salt Lake. In two summers' investigations in Utah 45 species of birds were found to attack the weevil. The killdeer was one of the most active of these.



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One Meal of a Brewer Blackbird.

The graphic record of a single bird for destruction of alfalfa weevils. These injurious insects formed 96 per cent of the food of this individual and numbered 442, chiefly in the larval stage; three adult weevils and remains of other insects in the stomach are shown at the bottom of the picture.

making alfalfa weevils a third of its food during part of the summer; one stomach contained no fewer than 383 individuals. 376 in the larval stage. The record for numbers—442 in one stomach—was held by the Brewer blackbird, an abundant species in Utah. A surprising discovery was that as a species the English sparrow was the most effective enemy of this insect; alfalfa weevils formed about a third of the food upon which its young were reared, and it was estimated that the number fed to growing English sparrows on a typical Utah farm was about 500,000. To this must be added the number eaten by the adult sparrows, which made of them about a fifth of their food. Most of the common birds of northeastern Utah were depending upon alfalfa weevils for almost a sixth of their entire food, and the destruction of these pests by this warfare is almost beyond conception.

The good work of birds in preying upon another weevil pest, the cotton boll weevil, must not be overlooked. Sixty-six kinds of birds are known to feed upon this formidable cotton destroyer, probably the most effective being the orioles, which actually remove the boll weevils from the place where damage begins—that is, the squares, or flower buds, of the cotton plants—and the swallows, which feed upon the weevils when in flight and seeking to extend their range. No fewer than 41 boll weevils were found in a single stomach of the Bullock oriole, and large numbers are habitually taken by all species of swallows: every one of a series of 35 eaves swallows had eaten them, the largest number in any stomach being 48, and the average 19.

Another serious agricultural pest that is freely eaten by birds is the wheat aphis, or green bug. On a 200-acre farm in North Carolina, where wheat, rye, and oats were severely attacked by green bugs, it was found that birds were very effective in destroying the pests. The outbreak was at its height during the migration season of such birds as the goldfinch and the vesper and chipping sparrows, which with other species on the farm numbered more than 3,000 individuals. It was found that these birds were destroying green bugs at the rate of nearly a million a day, and on days when additional flocks of migrants were present this destruction was doubled. During the season such numbers of birds flocked to the grain fields that the aphis infestation was reduced by an incalculable number.

A classic instance of the concentration of bird attack upon an army of insect invaders occurred during the severe outbreaks of the Rocky Mountain locusts between 1865 and 1877. So numerous were these voracious pests that many places visited by them were denuded of every green thing. A thorough investigation was made of the relation of birds to the outbreak, and it was found that practically every species, from the largest birds of prey to the tiny hummingbirds, from ducks and other aquatic fowl to typical bird denizens of the dry plains, turned to feeding upon locusts. In fact, most birds gorged themselves with this abundant supply of food, and in so doing were the means in numerous cases of saving crops from destruction.

Terrific Daily Warfare.

Conspicuous and important as are the activities of birds in gathering at the scene and taking part in the suppression of insect outbreaks, probably their every-day services in consuming insects of all kinds, thus holding down the whole tide of insect life, are of greater significance. No one who has observed the ceaseless activity of birds in feeding their young can doubt that the destruction of insects in this way is enormous. The house wren brings food to its young about once every two minutes all day long. Not many birds equal this record, but the average rate probably is one feeding to every 5 to 8 minutes. When one watches the parent birds hurrying out to forage, returning with a beak or mouth and gullet full of insects for the nestlings, and repeating this process every few minutes—when he observes that all the birds about are engaged in the same business, scouring ground, grass, trunks, branches, and foliage, the wonder is that any insects escape. Only their marvelous powers of reproduction enable them to survive this terrific warfare.

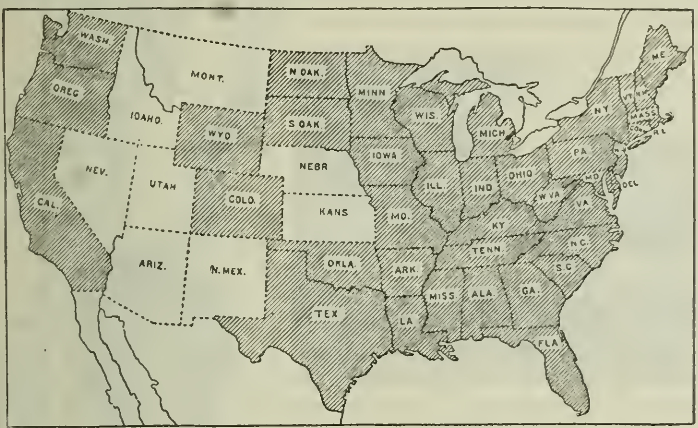
Not only at the nesting season but all through the year birds carry on an intense predatory campaign against the insect hosts. Hardly an agricultural pest exists but has numerous effective bird enemies. For instance, 25 kinds of birds are known to feed upon the clover weevil, and a like number on the potato beetle, 36 on the codling moth, 46 on the gipsy moth, 49 on horseflies, 67 on billbugs, 85 on clover-root borers, 98 on cutworms, 120 on leaf hoppers, and 168 on wireworms. These are but illustrations of the prevailing beneficial activities of birds; the list might be extended indefinitely.

The usefulness of birds in their destruction of crop pests, especially by concerted action in such cases, makes the subject of the total value of birds to the country very interesting. One of the principal factors for arriving at a valuation of these services is the number of birds in the country. All bird enumerations agree in setting two birds per acre as the average for at least the eastern half of the United States. On parts of this area many more are present, the number varying to a maximum of 59 pairs to the acre, and in part, at least, making up for the admittedly smaller number of birds in the West. On this basis, it is probable that there are 3,800,000,000 breeding birds in the United States, most of which are more or less insectivorous. Without doubt an equal number of migrants pass through the United States to their breeding grounds in the vast expanses of the Dominion of Canada and Alaska. On their northward and return journeys together, therefore, they spend on the average two months apiece in the United States. This means an effective augmentation of our insect-eating birds by a third. The total number of birds that prey upon our crop pests each season, therefore, probably is more than 4,500,000,000. In addition, all the native breeding birds rear one or more broods of young, which during the period of their growth consume an enormous quantity of insects. The size alone of this feathered army is beyond real conception, but since each individual in it may destroy a hundred or even many hundreds of insects daily, how enormously more difficult to realize is the total destruction of the insects and other animals making up their food. The great value of this service in terms of crop improvement demands that the people of the United States constantly bear in mind the welfare of their bird allies.

Our Attitude Toward the Birds.

The subject of bird protection has received great attention in the United States, and as the result of proof by the Biological Survey of the value of birds and of prolonged campaigning for bird protection by the American Ornithologists' Union and the National Association of Audubon Societies, the American Ornithologists' Union model law for the protection of birds has been adopted by 40 of the 48 States of the Union. The migratory-bird treaty act, putting into force a treaty with Great Britain for the protection of migratory birds, supplements and reenforces the State legislation. So far as desirable laws are concerned, the United States leads the world in bird protection.

It remains only for public opinion to back the law at every point, and for citizens to put into effect every practicable measure for the increase and conservation of bird life. Experience has shown that efforts to attract birds and increase their numbers are rewarded by very encouraging results. The essentials of bird attraction are the suppression of enemies and the provision of water, food, and nesting sites. From the normal number of one pair of birds to the acre under natural conditions, bird-attraction methods[1] have in-



Spread of Sentiment for Protecting Birds.

The shaded area shows the States that have adopted the American Ornithologists' Union model law for the protection of birds.

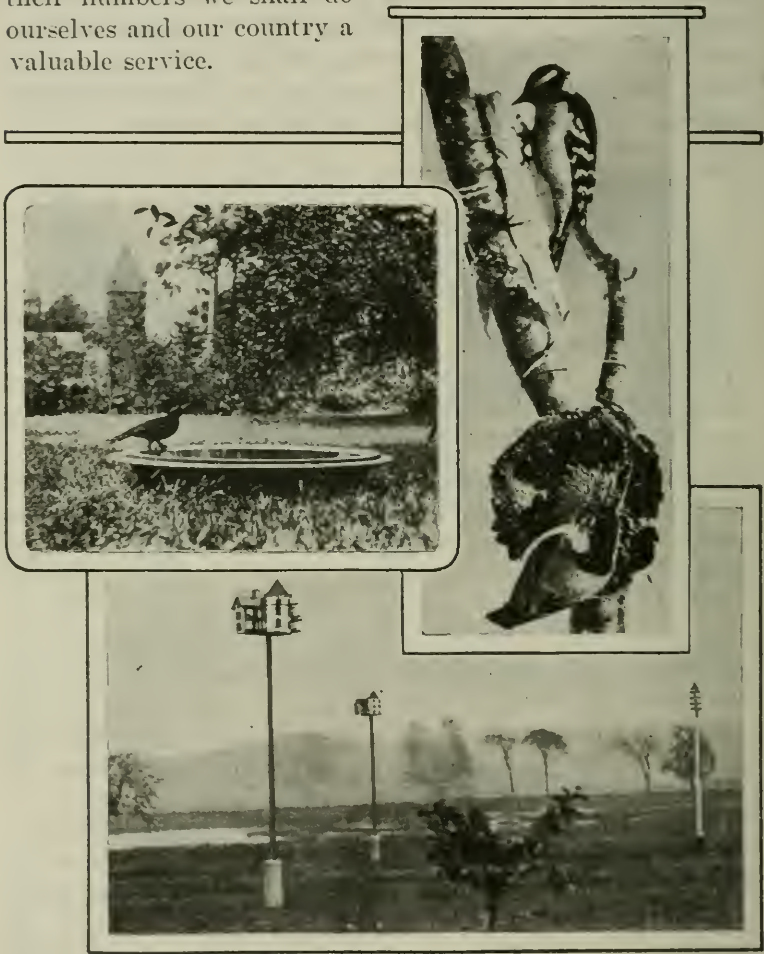
creased the number in certain areas to 10, 27, 40, and even 59 pairs. Areas inhabited by so large bird populations are practically immune from the destructiveness of insects.

Aside from the economic advantage of an increased number of birds, the esthetic phase of bird attraction must not be overlooked. Nearly every one enjoys watching birds. Birds typify life, beauty, and sprightly activity, and the songs of many of them are a source of great pleasure. Their presence in numbers means increase in all these forms of enjoyment.

Material increase in the numbers of birds admittedly is a two-sided problem: Some birds of negative value should

[1] Publications giving details of methods of attracting birds may be obtained upon application to the Department of Agriculture.

not be increased, while others, not now noticeably destructive, may become so when they are more abundant. On the other hand, there is no doubt that the majority of birds are more beneficial than injurious and that by increasing their numbers we shall do ourselves and our country a valuable service.



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Means of Attracting Birds.

Bird baths or drinking fountains, food, and nesting sites are the essentials for increasing the numbers of birds in a locality. Areas inhabited by large numbers of birds are practically immune from the ravages of insects. (Upper photos by F. E. Barker and Carl Purple, respectively; lower, by E. H. Forbush.)

HELPING LANDLESS FARMERS TO OWN FARMS

By L. C. Gray,
Economist in Charge of Land Economics.

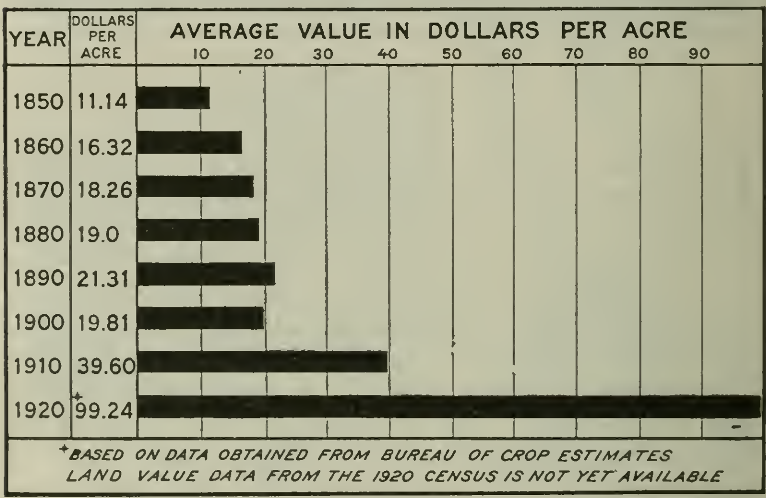
UP TO about 30 years ago the man who desired to become the owner of a farm could still obtain land of good quality by homesteading. By 1890, however, good free land in humid regions was becoming scarce. After that some good farm land formerly held in Indian reservations was opened to settlement. The opening of Oklahoma in 1888 and subsequently was the most notable instance, and the scramble for land was a striking indication of how scarce good free land had become. Following 1900 the land available for homesteading consisted largely of dry-farming land. At the present time there is practically no land suitable for ordinary farming to be acquired by homesteading. Semiarid lands adapted only to grazing, or to grazing with some incidental cropping in favored spots, is all that remains of the opportunity to obtain free land.

Farms Cost a Fortune.

For some time after 1890 it was possible to purchase good farm land at nominal cost from the States, railways, or other large holders of land, as well as from individual landowners. In the past 20 years, however, a veritable revolution in land values has practically eliminated purchase as an easy method of becoming the owner of a good farm. In 1900 the average value per acre of farm land and improvements was $19.81. It doubled during the next decade. And it is estimated that since 1910 the increase has been nearly threefold, so that in

1920 the estimated value per acre of land and improvements was $99.24. The changes since 1850 in the average value of land in the United States are shown in figure 1.

Considering the large areas of poor land included in farms, the average of practically $100 an acre for all the farms of the United States means that really good farm land is valued at $200 an acre and upward. Perhaps there are few districts where such land does not sell for from $200 to $500 an acre. At $300 an acre a 160-acre farm involves an investment of



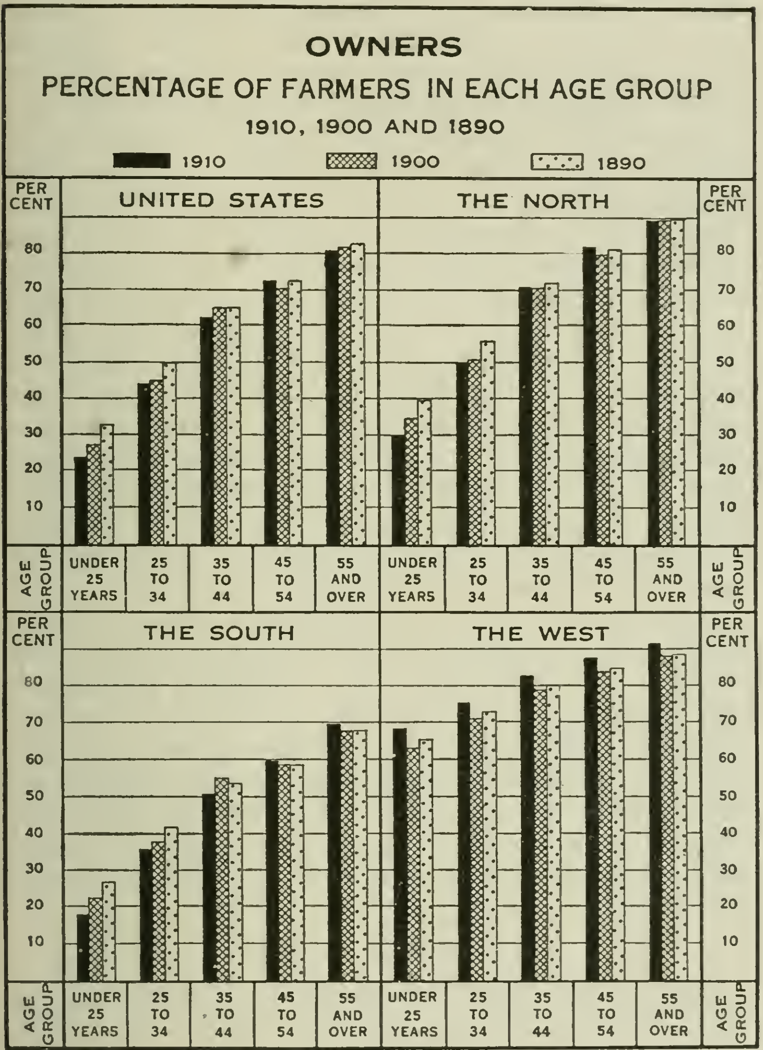
Land Values.

Fig. 1.—Changes in average value of land in United States, 1850–1920.

nearly $50,000, in addition to the capital needed for operation. In short, the ownership of a good farm and its equipment involves a considerable fortune.

How Difficult Is It for the Landless to Become Farm Owners?

In the past there has been a constant movement of tenants into the class of farm owners. The door of opportunity has been kept open. (See fig. 2.) Having in mind the radical change in land values pointed out above, we may well ask, What are the present opportunities for tenants and other landless farmers, as well as for various land-hungry city people with small capital, to become farm owners, and what can be done to make easier the process of climbing the agricultural ladder to farm ownership? This is one of a number of problems important to the future progress of American agriculture being systematically studied by the



Farm Owners.

FIG. 2.—Percentage of farmers who own their farms, classified according to age.

recently established Division of Land Economics in the Office of Farm Management and Farm Economics.

Broadly speaking, the would-be farmer may choose between two kinds of farming—pioneer or self-sufficiency farming and commercial farming. The former requires but little initial capital, for the land is usually cheap and can be bought on very easy terms, while the equipment usually employed in the first few years after settlement is not extensive. Probably from $1,500 to $3,000 may be considered as the amount necessary to begin to be a landowning pioneer farmer in these days of high prices, although some farmers make a start on less by spending a good deal of time working for others. While this kind of farming requires but a comparatively small initial investment it usually promises also but small money returns for a number of years.

If the farmer does not make too serious mistakes in selecting and purchasing the land and in the methods of improving it, he may expect to make a living, not infrequently attended by considerable hardships and privations, and to have the opportunity of investing his surplus labor in the gradual improvement of the farm. In course of time, moreover, he may benefit more or less from the gradual upbuilding of the community.

Becoming a farmer in regions of commercial agriculture involves the advantage of a considerable money income from the farm even in the first years. Generally, although not everywhere, commercial farming is carried on in communities in which there are advantages of developed roads and other forms of communication, schools, churches, and neighborhood social life. To offset these advantages the financial demands on the new farmer are likely to be greater both for initial capital required and for annual expenses for operation.

How Much Capital?

The amount of capital required for commercial farming varies greatly according to type of farming, section of the country, quality of the land, and size of farms. For some kinds of "specialty" farming such as trucking and poultry raising, comparatively little land may be required. However, this is offset somewhat by the relatively large expense for improvements and equipment. Moreover, the market for many agricultural specialties is comparatively narrow and easily glutted, so that such types of farming can not be expected to provide opportunity for a large number of new farmers.

One can, of course, reduce the amount of capital required for general farming by purchasing a farm smaller than the prevailing size in the community, but this is ordinarily hazardous, because the farm may not be large enough for efficiency. One way out of the difficulty is to buy a small improved farm and rent additional land from neighbors until sufficient capital is available to purchase more land. Many indications point to this as an advantageous arrangement for the man of small capital.

In the South and east of the Alleghanies in the North, land suitable for commercial agriculture is, generally speaking, cheaper than in the North Central States. The same is true of the great area of dry-farming lands stretching from about the 97th meridian to the Rocky Mountains. In the irrigated districts of the Rocky Mountain and Pacific Coast regions, as well as in the humid areas of these regions, land is comparatively high in value.

In the choicer sections of the corn belt and in the dairy regions of southern Wisconsin and Minnesota, a farm of normal size represents a total investment of from $50,000 to $100,000. The investment in the better farms of the winter wheat and spring wheat belts ranges from $30,000 to $50,000. An apple orchard of normal size in western New York involves a capital of $25,000 to $30,000. In the cotton belt farms of average size operated by owners represent an investment of $5,000 to $15,000. Many small poultry and truck farms in the North Atlantic States involve a capital of less than $5,000.

These few representative figures will make it easier to appreciate what the tenant or other landless farmer must undertake when he sets out to buy a farm, for in most cases he must buy it if he wants to own a farm. Some tenants, of course, may be expected to become farm owners by inheritance, gift, or marriage, but such data as are available indicate that the number is small in proportion either to the total number of tenants or to the total number of farms to be acquired.

Will the Farm Income Help Pay for the Farm?

What then are some of the conditions that affect the chances of tenants and other landless persons to purchase farms? The first important condition is the relationship of the income of the farm to the value of the land. In many sections of the United States the value of farm land has risen so high that the annual return is a very small percentage of the total value—much smaller than the ordinary return on sound investments such as bonds or first mortgages. This is true whether the return is in the form of cash rent or in the form of profits attributable to the use of the land by the owner after paying expenses and allowing a fair return for interest on other capital and for the owner's time.

Let us take cash rent for example, for share rent usually involves return to the owner for contributing supervision and sharing the risk of price changes and poor crops, as well as for supplying the use of the land. Numerous surveys show that the cash rent of farm land is not more than from 2 to 3 per cent of the value of the land in the great majority of areas in the corn belt. In a recent study of farm-land values in Iowa it was found that the average return in a very favorable year for the land operated by landowners was only 3.5 per cent, and this included return for the risk involved in farming.

This condition is attributed to a number of causes, one of the most important of which is the fact that land has been rising rapidly for the past quarter of a century and men buy land not only as an investment but also as a speculation, paying something more than the investment value because of the expected increase in value. Other reasons for the relatively high value of farm land as compared with its annual earning power are the tendency for many farmers and retired farmers to invest in land without considering the relative advantages of other methods of investment, also the fact that the farm yields benefits and satisfactions as a home, as well as a money income.

To what extent this condition is general throughout the United States it is difficult at present to say. The Division of Land Economics is engaged in assembling comprehensive information on this point, for it is recognized that the point is vital. When farmers must pay from 6 per cent to 10 per cent for borrowed money to buy land that will yield only 3 per cent it is obvious that the problem of buying a farm largely on credit to be repaid out of the proceeds of farming becomes exceedingly difficult. The tenant who can rent land for 2 per cent of its value is discouraged from purchasing when his own or borrowed money is worth 6 per cent or more, and he is inclined to leave the field to the speculator who can afford to consider the future increase in value as well as the present return. If we are to reduce to an important extent the present high percentage of tenant farmers, we must know more about the causes of the tendency to over-value land and the methods necessary to correct this tendency.

Less Than Nothing to Live On.

How far these conditions have already made it difficult to pay for a farm out of its earnings in a reasonably short time is indicated by a recent summary of the results of 26 farm-management surveys in different parts of the United States.[1] It was shown that if a man tried to buy a farm of average value and pay for it on the amortization plan out of the average net income of the farm, together with interest at current rates in the community, there would be less than nothing left to live on in 13 out of the 26 communities surveyed. In other words, even making no allowance for any money for living expenses there would be less than enough to make the annual payments on interest and principal, the deficits ranging from $28 to as much as $722. In 8 of the remaining communities, after meeting the annual payment for interest and principal, there would be left less than $200 for annual living expenses. Only in three communities was the remainder for living above $300.

It is possible, of course, to draw too gloomy a view from these facts, for there are a number of conditions which make them appear less serious. In the first place, the value of unpaid family living has been deducted as a part of farm expenses. On the average this may add from $100 to $200 to the means available for paying for a farm. Interest on operating capital has been deducted as an expense, and this

[1] "Can Farms of the United States Pay for Themselves," by George Stewart, Journal of Farm Economics, October, 1920.

interest may serve to supplement the amount available for expense of living and meeting annual payments. The figures are based on the average net returns in the several communities, whereas it is obvious that the more efficient farmers will earn returns above the average. Finally, the average farmer does not try to pay for the entire value of a farm out of its income, but usually has a part of the purchase price at the beginning. This, of course, greatly reduces the annual payment to cover interest and principal.

Initial Payment.

With given credit facilities the size of the initial payment will be larger for farms of high total value than for farms of low total value. Much also depends on how high a proportion of the purchase price is required under existing arrangements of credit and on the ability of the tenant to accumulate this amount in a reasonable time.

How much a tenant will put up for a first payment depends to some extent on how much wealth he has. In a recent local study made in one of the most productive districts of the corn belt it was found that the average net worth of tenants was $9,552. In that district the average amount of capital invested by farm owners in farm land, improvements, and operating equipment was $88,404 in August, 1919. In a somewhat less fertile section of the same State the average net worth of tenants was $3,415, while the average amount of farm capital in farms operated by owners was $44,080. In a recent study of tenancy in the fertile black land region of east central Texas it was found that the average net worth of tenants who rent for a half share of the crop ("croppers") is $715, while tenants renting for a third of the grain and a fourth of the cotton have an average net worth of $3,124. The average farm capital investment in land and equipment for the farms studied in this district is about $15,000.

The young man who has made good as a tenant is often able to buy a farm in the neighborhood where he is known, on a land contract with a very small initial payment and with a long period in which to pay the remainder. In areas where they are many well-to-do farmers wishing to retire and leave their money in the land, this unorganized credit is an important factor in aiding tenant farmers to become owners. Where there are farm profits from which to save, credit is the institution which enables the tenant to acquire ownership of land in the areas of high land values long before he has earned enough to pay the whole price of the farm.

What Help Does the Farm-Loan System Provide?

When the Federal farm-loan act was under consideration it was hoped that it would prove an important aid to tenants and other landless persons in acquiring farm land. As finally drafted, however, the provisions of the act were made extremely conservative for the purpose of rendering the security back of each loan as safe as possible. The act provides that the loan shall not exceed 50 per cent of the value of the land and 20 per cent of the value of improvements. Recent studies show that the average loan is only 37 per cent of the total value of land and improvements conservatively appraised. However, persons borrowing specifically to buy land have obtained an average of about 43 per cent of the total value of land and improvements.

In a study recently made by the Division of Land Economics it was found that only about 13 per cent of the total loans made by the farm-loan banks were for the purpose of buying land, although the percentage appears to be increasing to some extent. Of those borrowing to buy land about two-thirds already own other farm land. A little over one-third of those borrowing from the farm-loan system to buy land are tenants. As loans by the Federal land banks comprise only about 8 per cent of the estimated mortgage indebtedness and 8 per cent of the new mortgage loans made in a single year, it is apparent that these banks have not yet become an agency of paramount importance in promoting farm ownership.[1]

[1] It is true that a larger percentage of the loans approved by Federal joint stock banks have been for the first purchase of farm land (26.5 per cent). However, the total loans approved by these banks up to January 1, 1920, amounted to less than a fifth of the loans made by the Federal land banks.

Second Mortgages.

In view of the fact that on the average only 43 per cent of the purchase price is obtained from the Federal farm-loan system, we may well ask how the would-be farm owner is to finance the remainder of the purchase price. Those who have borrowed on second mortgages in addition to loans on first mortgages through the farm-loan system have largely obtained their loans from the sellers of the land. This was true of 78 per cent of the sales involving second mortgages. Many of these sellers were relatives of the purchasers. For the most part the terms of second mortgages were more liberal in cases where the seller became the mortgagee. Leaving out of account the motives that prompt relatives to give unusually favorable credit terms, it is a well-established practice for sellers of land to make favorable terms in consideration of the profits or other advantages gained from making the sale.

These facts point to the conclusion that there is little commercial machinery for the making of loans on second mortgages, and that such mortgages are now handled largely by persons who make the loans, not primarily for investment purposes, but rather from some other motive. However, the making of loans on second-mortgage security where the first mortgage is held by the Federal farm-loan banks is likely to be more satisfactory from an investment standpoint than is the case when the second mortgage is preceded by a first mortgage held by private persons or agencies under the usual terms. There are a number of reasons for this. The first mortgage under the Federal farm-loan system runs for a long period, 34½ years, and during that time there is little danger of foreclosure. Moreover, the comparatively small annual payments on the principal of the first mortgage leave the borrower substantially free to pay off the principal of the second mortgage. If the loan is made for the purpose of buying land, the first and second mortgages are likely to be made at the same time. This makes it possible to base both loans on the same appraisal, thus economizing expenses and giving the lender on second mortgage the assurance of a conservative appraisement of the security of his loan.

It is probable, however, that even these more favorable conditions for the making of second-mortgage loans will not attract private capital in large quantities to this form of investment because of the general distrust of second-mortgage loans and the consequent lack of an open market for such loans. On the other hand, the importance of promoting rural home ownership would seem to justify making some kind of provision for such loans.

Small Additional Credit Needed.

As compared with the total requirements for farm-mortgage credit the additional credit to be supplied would be relatively small. A large proportion of the annual demand for loans is for the refunding of old indebtedness, for making improvements, extending the scope of farm operations, investing in other businesses, or purchasing land in addition to that already owned. In the study referred to it was found that of the 13 per cent borrowing from the Federal farm-loan banks to buy land, two-thirds already owned farm land. Moreover, of those landless persons borrowing to purchase a farm a considerable number are doubtless able to finance the deal by the employment of first-mortgage credit alone. It would also be desirable to restrict the benefits of such a system to those who could demonstrate sufficient experience and other personal qualities to insure the probability of reasonable success as farmers, and also to those who possess no other important tangible assets that may be made the basis of credit except what is to be invested in the farm. Since the farm-loan system provides a means by which an average of upward of 40 per cent of the value of an improved farm may be obtained on first-mortgage credit, it is only necessary to supply an additional 30 or 35 per cent of the purchase price in aid of landless persons with small capital seeking to become owners.

A Necessary Limitation.

This additional credit should be supplied only in cases where the first mortgage is held by the Federal farm-loan system, thereby removing the danger that exists when the first mortgage and second mortgage are held by different parties. However, the two loans should not be merged in a single mortgage. It is not desirable to impair the investment reputation of Federal farm-loan bonds by including loans made on a less conservative basis, and such impairment would occur even though the less conservative loans were but a small per cent of the total. Again, it is probably desirable to encourage a reasonably early repayment of the margin of indebtedness in excess of that based on first mortgages under the Federal farm-loan system. Finally, it is only fair to compel those who require the additional margin of credit to pay a higher rate because of the greater element of risk rather than to distribute these extra charges among all borrowers, including those borrowing on a conservative margin of security.

Ordinarily the first-mortgage loan is made on security so ample that there is little likelihood of loss on any individual mortgage. This is rendered necessary by the practice of reselling mortgages or using them as security for bond issues. But it would be possible to lend on a less conservative basis, taking the risk of loss on some loans and distributing this loss as an extra charge over the total number of loans of this class, according to the principle of insurance. The amount of the charge would necessarily depend on the margin of credit granted. That is, it would be greater if the margin were 80 per cent than if it were only 75 per cent, etc. How high such charges should be above the basic interest rates on first mortgages is a problem on which the Division of Land Economics and the Division of Farm Credits are attempting to throw additional light.

New Lands.

For the man who does not care to shoulder the heavy burden of land values and the accompanying load of indebtedness involved in purchasing lands in well-developed agricultural areas, there is the alternative of migrating to some undeveloped region.

A half century ago such a pioneer could have for the taking rich prairie lands or fertile woodlands in regions of ample rainfall and reasonably satisfactory conditions of temperature. This opportunity no longer exists. A study of our land resources indicates that probably a billion acres, or more than double the improved acreage in 1910, can never be used for crops. There remains probably about 370 million acres of potentially arable land yet to be developed. However, a large part of this area, probably nearly one-half, consists of woodland or wet land already included in farms. Practically all of the 370 million acres comprises lands that have heretofore been avoided by those seeking farms, because of natural disadvantages. Thus, it is estimated that 200 million acres consists of cut-over or timbered land that must be cleared of trees, stumps, or small growth. Perhaps one-half of this is now in farms. Of the remainder a large part is light sandy soil of comparatively small agricultural value. There are approximately 60 million acres of swamps and other wet lands. Much of this is characterized by rich soils, but there are large areas of peat bogs unsuited to agricultural uses. It is estimated that probably 30 million acres of land may yet be reclaimed by irrigation. It is possible also that there may be some extension of area by dry-farming methods, although the most available lands for this use are probably now in farms. Finally, there is approximately 50 million acres of land in the Eastern States classed as "Improved land other than woodland" and consisting largely of unused fields, stony upland pastures in hilly regions, and waste lands. A large part of this area is already included in farms.

Some of the above-mentioned disadvantages are removable by drainage, irrigation, and clearing, but the expenditure of capital may be prohibitive, even if the soil and climate are potentially suitable to agriculture. Certain areas of wet lands must not only be drained and protected from overflow, but also cleared of a heavy growth of stumps and underbrush. Although the soils are potentially rich and the rainfall ample, the cost of development into farms may be justified only in periods when prices of farm products, and consequently land values, are relatively high. On the other hand, there are large areas of light sandy lands that can be developed and equipped for farming purposes at relatively small expense, but the prospective yields are too small, except in periods of high prices for agricultural products, to cover the expense of cultivation, including the application of large quantities of fertilizers.

The rapid rise in prices of farm products of the war period tended to stimulate interest in these undeveloped areas; but parallel to this rise of prices occurred the rapid increase in the costs of rendering such lands available for use. Moreover, the possibility that the prices of farm products, as well as the prices of other things, may subsequently be lower than at present has emphasized the importance of conservatism in investing large sums of money in reclamation and clearing at the present high level of cost.

What Do the Settler's Chances of Success Depend Upon?

No more important problem confronts the Nation than the proper development of these unused areas, and it seems desirable to make clear some of its important aspects.

In the first place, it is highly important to determine the proper rate of development. It is obvious that this enormous area can not and should not be brought into use in a short time. If the rate of development should be too rapid it would imperil the success of those settling the lands as well as the prosperity of agriculture as a whole. It is important that the process of development be based on a wise selection of areas immediately to be developed, the less suitable areas being reserved until the demand for agricultural products justifies their development.

It is essential that the methods employed in developing and settling these areas be such as to give the settler a reasonable chance of success. This involves intelligent adjustment by the settler to the conditions of the region—the selection of economical methods of clearing the land, a suitable type of improvements in the early years of settlement, the proper selection of farm enterprises, methods of farming best suited to conditions of soil and climate, etc. In part, however, the settler's chance of success depends on the conditions under which he is brought to the region and placed on the land; and nowadays these conditions are largely determined by the agency which induces him to buy the land. A half century ago migration to new lands was largely spontaneous. At present it is largely induced and directed by the numerous private agencies of various kinds, operating mainly for profit, which are interested in the sale of undeveloped lands.

Difficulty of Picking a Farm on New Land.

Those seeking a career on the land should receive such direction as will insure a maximum opportunity for success, and should be protected from those individuals and agencies which seek to exploit this land hunger.

Numerous inquiries received by the Division of Land Economics indicate that considerable numbers of persons want to get farms somewhere but have little idea of geographic conditions in different sections of the country and of their relative advantages and disadvantages for farming. This ignorance is equally characteristic of large numbers of buyers in the selection of the farm after they have decided on the section in which they desire to settle. Even persons with considerable farming experience are likely to be incapable of wise selection in a region essentially different from that with which they are familiar. Thus thousands of farmers from the corn belt have purchased land because the soil looked black and rich, without recognizing the menace of alkali or the uncertainties of water rights. Other thousands have bought useless peat lands for the same reason.

If experienced farmers find difficulty in making a wise selection in new and undeveloped regions, how much more is this the case with people who have not had farming experience! It seems probable that the largest class of buyers who purchase farms from land companies in the cut-over lands of the Great Lake States consists of laborers from the copper and iron mines and lumber camps of the region. The next largest class comes from Chicago, Milwaukee, and St. Paul, and some of the smaller cities of the region. Many of these are wage earners from the steel mills of Chicago seeking to escape the stress and strain of industrial labor by investing their small savings in land. Many of them have had little or no farming experience.

Land Sharks.

The prospective buyer's ignorance of fundamental conditions provides the peculiar opportunity of the exploiting land company. An enormous business has developed in various parts of the country for the purpose of profiting by this condition. Sometimes it takes the form of selling substantially worthless land at what appears to be a low price. Sometimes the company is selling good land, but at prices far in advance of its normal value.

It is basic to a proper understanding of the problem to recognize the fact that the methods of advertising and selling are substantially free from specific misrepresentation. It is a fundamental policy of large land companies to avoid statements that can involve the company in a lawsuit and particularly that will incur the danger of prosecution for misuse of the mails. Occasionally a slip occurs on the part of some overeager salesman or advertising agent, but such occurrences are merely incidental, and, for the most part, avoidance of specific misrepresentation is held to be a cardinal principle of land salesmanship. Such a policy is justified not only on grounds of safety, but because it is recognized that specific misrepresentation is a clumsy tool not needed in overcoming the inertia, timidity, or suspiciousness of the prospective buyer. By the employment of ambiguous phrases, half truths, skillful omission, and subtle suggestions, the buyer may be led to form the desired impression. What can be more innocent than printing pictures of well-equipped farms in the same county in which the land company is selling land, leaving the buyer to assume that the company's land is of the same kind? Indeed, it must be recognized that misrepresentation of facts even by suggestion is not so prevalent as the creation of exaggerated impressions.

The Policy of "Let the Buyer Beware."

It is but fair to recognize that among land companies there are all degrees of variation as to honesty of intention. Without doubt comparatively few are consciously pursuing what they consider to be dishonest methods. "Good salesmanship" in the business world involves creating a favorable impression on the minds of prospective buyers, and, provided no specific misrepresentations are made, few salesmen consider themselves obligated to reveal the weak points as well as the strong points of the goods sold. Especially if the article sold is of fair to good quality the salesman suffers no qualms of conscience if his salesmanship results in a sale at a price somewhat above the normal value. To admit this is not to condone the large volume of land sales made with the deliberate intention of selling land of inferior quality at an excessively high price with the expectation that the buyer in despair will ultimately allow the contract to lapse, leaving the company free to sell the land to the next victim. It is merely to admit the fact that many companies may be and are doing an entirely legitimate business according to the usual standards of business, and that the serious results are due to the fact that the land is sold at a price above that which the normal value of the land justifies; a price so high that the settler has but a slim chance to make a financial success of his enterprise. Even when this is true, the company may not be making an excessively large profit, for the high margin of gross profit on the land may be more than absorbed by heavy development costs, advertising and selling expenses, or carrying charges.

Hardship Attends the Policy of "Let the Buyer Beware."

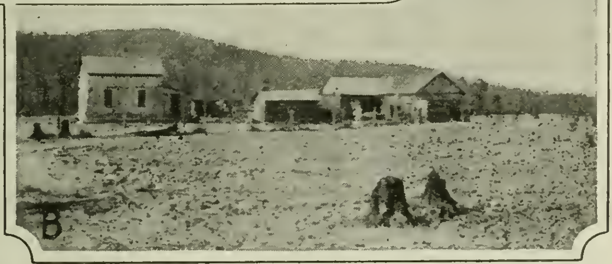


Fig. 3.—*A*, Type of farmstead found in the cutover districts of the Lake States. The family living here has to carry water three-fourths of a mile. *B*, Home of a settler who has built two houses in the cutover country—the first on land that belonged to some one else, where he had been inadvertently located by a land company. For time and labor wasted in building and clearing he was permitted to buy this second farm at a "reduced price."

Settlers moved by the impulse to become land-owning farmers are being induced by thousands to invest painfully accumulated savings, to waste years of labor, and frequently to endure severe hardships in undertakings which offer but doubtful chances of success, with the consequent discouragement and disillusionment of themselves, as well as of others who might be considering a career on the land.

It is of vital concern to the Nation that this movement to the land be not only not impeded, but that it be guided and directed in such a manner as to establish a stable agricultural industry in these newly developing areas.

It is necessary not only to make possible the intelligent selection of the farm at a reasonable price, but also to provide other important conditions of success. The proper selection of settlers, the size of the tract to be purchased, the amount of cleared land and the initial improvements to begin on, the equipment required in the early years of settlement, the amount of capital, the terms of credit, facilities for direction and guidance of the settler after settlement, community improvements and cooperation are being studied by the Division of Land Economics.

A National Policy of Land Settlement.

In stimulating and directing the process of developing and settling on reserve agricultural areas, four courses are possible, if we leave out of consideration the policy of allowing private agencies a free hand. (1) The State and Federal Governments might undertake the task of regulating private land-selling agencies. (2) The State and Federal Governments might leave the work to private initiative, but rely on a policy of courageous publicity not only to prevent abuses but also to stimulate the employment of the most successful methods. (3) The States or the Nation might possibly supplement such a policy of education by undertaking on a moderate scale the operation of colonization enterprises for experimental and demonstration purposes. (4) Finally, the States or the Federal Government might undertake on a comprehensive scale the task of developing and colonizing new agricultural areas.

It must be acknowledged that it is yet an open question which of these four policies is likely to be best suited to conditions in the United States. When more information concerning the problem has been assembled it is probable that the line of procedure will be more apparent. The policy followed in the past with respect to the settlement of our undeveloped regions is not longer to be tolerated. It is imperative that a policy be formulated which will provide for adequate development of the unoccupied lands on a basis favorable to the success and stability of the settlers.

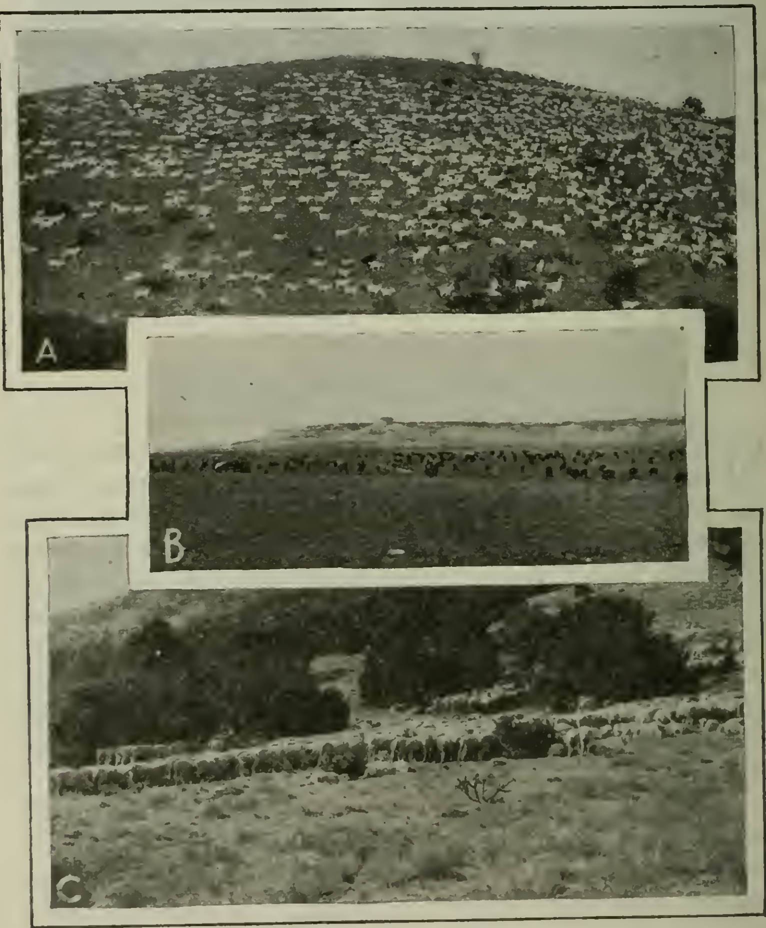
HUNTING DOWN STOCK KILLERS

By W. B. Bell,
*Assistant Biologist in Economic Investigations,
Bureau of Biological Survey.*

Wolves, coyotes, bobcats, mountain lions, bears, and their kind have slaughtered their prey from prehistoric times. Sometimes they pulled down victims in plenty, sometimes their pickings were lean—until the advent of civilized man. In man's introduced herds of cattle, sheep, goats, colts, and other domestic stock, the original rangers of the country found a readily available supply of food to be preyed upon day after day and night after night. What more natural than for the hungry wolf to draw upon the ever-replenished reservoir discovered in the stock corral or on the open range?

The nature of the business on which the predatory kind were engaged was no secret, of course, and gun, trap, and poison were resorted to by the early ranchers, each man for himself, with now and then a community hunt as the needs were more or less pressing. Learning that they had to contend with protectors of their new-found food supply, the prowlers became more and more wary in approach and kill, until what originated in a mere matter of satisfying a craving for food has developed into a war to the death.

Uncle Sam, tired of a drain on his resources of from $20,000,000 to $30,000,000 every year through the slaughter of domestic stock by predatory animals, now keeps constantly in the field a force of hunters who are instructed to wipe out these nonproducers. In their place, and safe from their depredations, it is the aim to populate the range country with flocks and herds, and in this way to lower the cost



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Flocks and Herds Now Protected from Predatory Animals.

A, Goats, hardy and valuable introductions to southwestern pastures, formerly were a prey of wolves, coyotes, and bobcats (photograph from Farm Management). *B*, Cattle, as a substitute on western ranges for buffalo, deer, elk, and antelope, were equally acceptable to wolves and other predatory animals. *C*, Sheep raising was a precarious undertaking so long as coyotes were at large. Cooperative campaigns against the stock killers have greatly reduced their depredations and have increased correspondingly the yield of wool, hides, and meat.

of production of live stock and of the meat that goes upon the family table.

Losses of live stock from ravages of predatory animals are among the most spectacular and exasperating of those suffered by the stockman. Disease may decimate his flocks and herds, or drought or wintry storms may result in the starvation or death of numbers of valuable animals. None of these disasters, however, arouses such resentment and determination to settle the score as arises in the heart of the ranchman when wolves or other stock destroyers enter corrals or operate on the open range, maiming and killing his cattle or other domestic stock.

The average destruction by these animals is estimated to be for each wolf and mountain lion about $1,000 worth of live stock annually; each coyote and bobcat, $50 worth; and each stock-killing bear $500 worth. Statistics may leave the stockman unmoved and uninterested, but a vivid, lasting impression is made when he finds one of his own valuable steers pulled down by a wolf, one of his colts struck down by a mountain lion, the scattered carcasses of several of his sheep killed by coyotes for sheer lust of killing, or a valuable cow maimed or with skull crushed by a blow from the powerful paw of a grizzly.

Since the beginning the hand of the stockman has been raised against predatory animals; and every known means at his disposal—guards, guns, traps, poisons, bounties, and inclosures—have been employed to secure the protection of his flocks or herds from their depredations. Individual efforts have been supplemented of late years by organized endeavor through stockmen's associations and the securing of State and county legislation.

The Government Takes a Hand.

Careful field studies of the abundance, habits, and relationship of predatory animals to the live-stock industry had been made by the Biological Survey of the United States Department of Agriculture for many years. Men with keen insight into animal psychology and the ways and motives of wild creatures had sought out improved methods of luring them to destruction when their presence was detrimental to the live-stock business. The first demonstrations and experiments for the control of wolves and coyotes were conducted during the year 1914–15 in Colorado, Nevada, Texas, Idaho, Oregon, and other western States. In eastern Oregon and northern Nevada, where rabies prevailed among coyotes at that time, a considerable number of hunters were employed to assist in destroying the coyotes in the hope of eradicating this disease.

Depredations upon live stock continued to be so serious and the means of protection then employed afforded so little real relief to the stock-raising industry that in 1915 stockmen took up the matter with their representatives in Congress with the view of obtaining the aid of the Federal Government. On July 1, 1915, the first appropriation—$125,000—resulted, specifically providing Federal funds to assist in organizing campaigns against predatory animals on national forests and other public lands and to correlate and direct the many agencies at work on the problem along the most effective and economical lines. This had as its object making distinct and permanent headway in relieving the stockmen from the serious drain caused by predatory animals upon the productive capacity of the great western ranges.

The Biological Survey then undertook to build up the necessary field organization. The principal western live-stock producing States where the need appeared most urgent were formed into eight predatory-animal districts, each in charge of a predatory-animal inspector. The hunters employed devoted their entire time to the work, and were not permitted to receive bounties from any source. The skins of all animals having fur value taken by the hunters became the property of the Government and were sent in to the Department and sold at public auction, the receipts being turned into the United States Treasury.

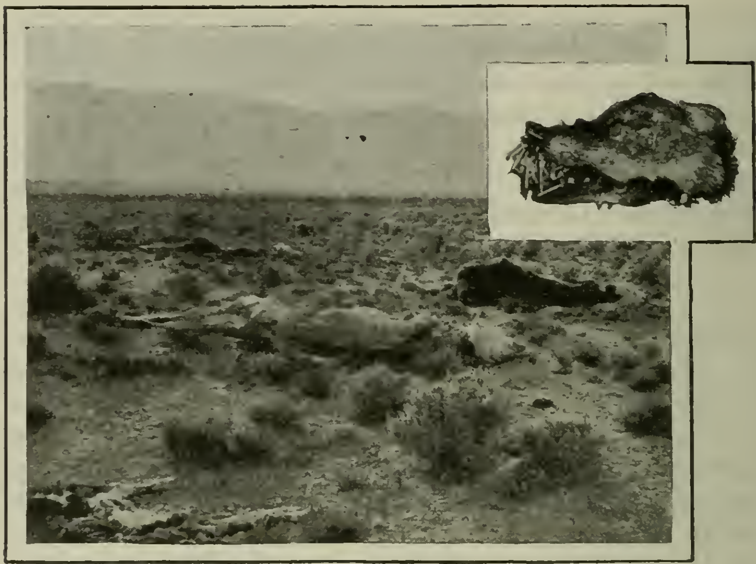
Methods of Combat.

Three methods of destroying predatory animals were followed at this time—shooting, trapping, and poisoning. During the first year 424 wolves, 9 mountain lions, 11,890 coyotes, and 1,564 bobcats were accounted for. Extended trapping and poisoning campaigns were carried on, but the above numbers do not take into consideration animals killed by poison unless the bodies were actually recovered and the skins or scalps secured. Demonstrations and experiments were carried on in localities other than on national forests and public lands, where predatory animals were causing heavy losses of live stock. Great added impetus and intensity of purpose were given this work by the appearance, spread, and dread destructiveness of rabies, which gained a foothold, particularly among coyotes and wild cats, in southwestern Idaho. To effect the suppression of rabies among wild animals Congress provided an emergency appropriation of $75,000, which became available March 4, 1916.

Suppression of Rabies.

Special work for the suppression of rabies, made possible through the emergency appropriation, was conducted under the supervision, organization, and methods that were followed in the regular predatory-animal operations. The alarming increase of rabies among wild animals, particularly coyotes, was attended with danger to live stock and also to human beings. The seriousness of the outbreak is indicated by the fact that during the year the State authorities of Nevada treated more than 60 persons who were bitten by either wild or domestic animals. So great was the dread inspired by the presence of these maddened wild animals that children were accompanied to school by armed guards. Driven by their rabid blindness, coyotes entered the yards of dwellings, attacking dogs, cats, human occupants, or any object they might encounter; they entered feed lots and snapped and infected cattle, sheep, and other domestic animals; and also attacked pedestrians, horsemen, and automobiles on the public highways. The destruction of live stock was enormous. In a feed lot at Winnemucca, Nev., a single rabid coyote caused the loss of 27 steers. The State of Nevada promptly appropriated $30,000 to cooperate with the Survey in waging a campaign against the pests in that State. The work was prosecuted vigorously through trapping and extended poisoning operations, the spread of the disease was materially checked, and plans were further developed for its limitation and ultimate suppression.

The movements of live stock between their summer and winter pasture ranges, with accompanying movements of dogs and predatory animals, made possible an extension of the disease into the contiguous territory of eastern Oregon, southern Idaho, northern California, the western half of Utah, and even into eastern Washington. Cattle and sheep



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Results of Rabies Among Coyotes.

During the first year of the rabies epizootic, over $500,000 worth of live stock were killed by infected predatory animals in Nevada alone—in one feed lot 27 steers were killed by a single rabid coyote. Inset picture: Head of coyote found decorated with porcupine quills—evidence of an unusual encounter, but illustrating the characteristic blind fury of rabid coyotes. The spread of the disease has been checked by the Biological Survey's cooperative campaigns.

were destroyed in large numbers through this extension of the disease, and at least 1,500 persons were bitten by rabid animals. A few cases of rabies were reported in Montana and Wyoming, but prompt action resulted in stamping it out in these localities before it could gain a foothold. The measures employed by the Biological Survey in Nevada were applied in the States mentioned, and with the cooperation of the local authorities further spread of the disease was effectually stopped. The measures for the control and eradication of this dread disease are now so well understood that the occasional sporadic outbreaks are promptly met and stamped out by detailing specially trained men to each locality.

The Kill.

The following typical cases of losses are illustrative of the destructiveness of predatory animals and of the importance of operations for their control: In Colorado a single wolf took a toll of nearly $3,000 worth of cattle in one year. In Texas two wolves killed 72 sheep, valued at $9 each, during a period of two weeks. One wolf in New Mexico killed 25 head of cattle in two months; while another was reported by stockmen of the same State to have killed 150 cattle, valued at not less than $5,000, during six months preceding his capture by a Survey hunter. In Wyoming two male wolves were killed, which during one month had destroyed 150 sheep and 7 colts; another pair were reported to have killed about $4,000 worth of stock during the year preceding their capture; while another, captured in June, had killed 30 head of cattle during the preceding spring. The county agricultural agent at Coalville, Utah, reported that wolves had taken 20 per cent of the year's calf crop in that section. A wolf taken in New Mexico was known to have killed during the preceding five months 20 yearling steers, 9 calves, 1 cow, 15 sheep, and a valuable sheep dog. In two weeks at Ozona, Tex., two wolves killed 76 sheep.

In Oregon four coyotes in two nights killed 15 purebred rams valued at $20 each. One flock in Morgan County, Utah, was attacked by three coyotes and $500 worth of sheep were killed in an hour. Near Antonito, Colo., 67 ewes, valued at about $1,000, became separated from the rest of the herd and two days later all were found killed by coyotes.

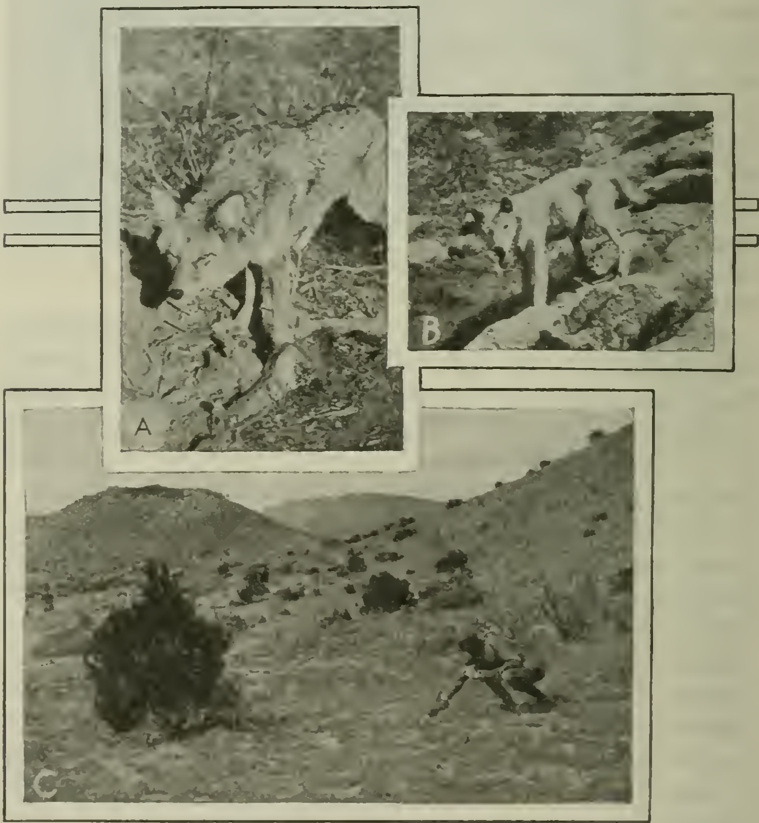
One bobcat in Texas killed over $300 worth of Angora goats; and another taken at Ozona, Tex., in a month had killed on a single ranch 53 rams, 1 ewe, and 1 goat. In New Mexico a Biological Survey hunter killed a grizzly bear which had killed 32 head of cattle during the spring and was known to have killed 50 cattle the previous year. In Arizona, while following the trail of a mountain lion which was later killed, one of the Department's hunters found the bodies of nine head of cattle which had been killed by this animal.

After a personal investigation in 1917, the president of the State Agricultural College of New Mexico reported that 34,350 cattle, 165,000 sheep, and 850 horses are killed annually by predatory animals in that State, these losses amounting to $2,715,250. This involves the loss of 16,000,000 pounds of meat and about 1,320,000 pounds of wool.

"Getting" the Chief Offenders.

Whenever especially destructive animals are reported, exceptionally skilled hunters are detailed to capture them. The success that has attended this plan of procedure is evidenced in a great addition to the meat output of the ranges and in the active support of local stockmen.

The effectiveness of the plan of organization for "getting" the most destructive individuals is well illustrated by the



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The Portion of Coyote and Wolf—Trap and Poison.

A, Trapped coyote—more than 250,000 of his ilk have been accounted for in five years by Federal and cooperating hunters. *B*, The $10,000 "Split Rock" wolf—trapped in 1920, thus ending a tribute exacted of at least 50 head of cattle annually. *C*, Expert Biological Survey hunter distributing poisoned baits to rid the range of the wily coyote.

recent success of a Biological Survey hunter in dispatching the notorious "Custer wolf," as it had come to be known. This animal had ranged in a territory about 40 by 65 miles in extent in the vicinity of Custer, S. Dak. During the six or seven years that he is known to have patrolled this territory stockmen who suffered from his depredations estimated that he had killed at least $25,000 worth of cattle. His killings were particularly exasperating, owing to the number of stock slaughtered at times when he appeared to go on a killing debauch, and to the savage mutilation of others—many cows having been killed for the sole purpose of devouring their unborn calves. Because of this and of the reputation which the animal gained for supernatural cunning in eluding hunters and avoiding skillfully placed traps and temptingly prepared poison baits, unusual efforts had been made by sportsmen to "get him." Stockmen, driven to desperation, offered increasingly large bounties, until there was a price of $500 on his head. Still he escaped.

Some ranchers gave up hope and said they must board the outlaw until he died a natural death. Others, more sanguine, appealed to the local predatory animal inspector of the Biological Survey for the detail of a hunter, and one of the best trappers and shots in the service was sent on this mission. During several weeks of hide and seek the wolf displayed his uncanny cunning but finally placed his front foot squarely in a trap baited with scent material obtained from another notorious wolf that had been taken by the predatory animal inspector at Split Rock, Wyo. As he dashed away, the trap drag caught firmly on a tree, but the swivel snapped. Dragging the heavy trap with him, the wolf traveled a distance of 3 miles before the hunter, close on his trail, got a shot at 300 yards and ended his career of destruction. Many wolves of similar cunning have been taken by Biological Survey hunters, but this animal was one of the most difficult to capture.

The death of the Custer wolf was hailed with delight by stockmen throughout the region where the depredations had occurred, and has added impetus to a movement for cooperation with the Department in order to meet more adequately the needs of the live-stock industry.

Present Fighting Organization.

During the fiscal year 1920 a force varying from 300 to 400 skilled hunters was employed under the direction of district inspectors of the Biological Survey. The work is now organized into 13 districts, each with a trained inspector in charge, as follows:

1. Arizona.
2. California.
3. Colorado.
4. Idaho.
5. Montana.
6. Nevada.
7. New Mexico.
8. North Dakota and South Dakota.
9. Oregon.
10. Texas.
11. Utah.
12. Washington.
13. Wyoming.

The hunters of the various districts are paid in part from the Federal Treasury and in part from cooperative funds supplied by State appropriations and from contributions from live-stock organizations and individuals. The amount thus provided by cooperators in the year 1920–21 totaled $272,509. There has been a steady, consistent increase in the funds provided by State appropriations, by stockmen's associations, and by individuals for cooperation with the Department in this work, as the direct benefits derived from the systematically organized operations became evident. Present prospects indicate that the cooperative funds will be materially increased for the ensuing year.

Study and experimentation by experts have resulted in great improvement in the methods and practices employed in eradicating predatory animals. The poisoning campaigns have increased in number and have been more effectively organized each succeeding year. Their success has been such that in many areas stock growers are urging their application during the appropriate season. These campaigns have been followed by a marked decrease in the number of coyotes in the sections poisoned, with a corresponding decrease in the losses of sheep, cattle, pigs, colts, and poultry. Reports from stockmen indicate that on many ranges and lambing grounds the former heavy annual losses have become negligible or have been entirely eliminated.

Killers Killed.

The following statement shows, by States, the number of true predatory animals—the chief live-stock destroyers—which have been killed and their skins or scalps secured from the time the work was initiated, July 1, 1915, to June 30, 1920, a period of five fiscal years. The table does not include the large number of animals poisoned, as no complete record can be obtained of those that travel so far before the poison takes effect that they can not be located in time to secure skin or scalp. The large numbers of coyote carcasses found by stockmen while riding the range following poisoning operations afford strong evidence in support of the estimate which has been made by the Biological Survey that the animals thus destroyed equal in number the total of all those killed by other means and included in this table.

Predatory animals destroyed in Biological Survey and cooperative campaigns from the initiation of the work, July 1, 1915, to June 30, 1920 (not including animals poisoned).

States.	True predatory animals killed.						Year cooperative work was begun.*
	Bears.	Bobcats and lynxes.	Coyotes.	Mountain lions.	Wolves.	Total.	
Arizona	17	695	3,711	182	146	4,751	1919
Arkansas	....	12	....	....	17	29	None.
California	10	796	3,961	26	....	4,793	1919
Colorado	22	372	5,447	35	109	5,985	1918
Idaho	34	1,323	12,747	9	75	14,188	None.
Montana	26	360	5,202	....	287	5,875	1918
Nevada	3	4,268	23,286	21	4	27,582	1916
New Mexico	82	1,237	6,056	141	385	7,901	1918
North Dakota	....	....	337	....	....	337	1920
Oklahoma	....	9	8	....	73	90	None.
Oregon	51	1,742	8,594	41	16	10,444	1920
South Dakota	1	58	794	....	23	876	None.
Texas	....	1,763	10,321	6	1,283	13,373	1918
Utah	22	2,141	14,509	69	142	16,883	1918
Washington	23	254	8,362	2	....	8,641	1918
Wyoming	26	344	6,011	8	376	6,765	1918
Total	317	15,374	109,346	540	2,936	128,513	....

* The date refers to the fiscal year ended June 30 in each case.

Money in the National Pocket.

The sale of skins taken by the Federal hunters has enabled the Biological Survey to turn in to the United States Treasury in the five years ended June 30, 1920, $240,423.63. Estimates based on information supplied during the last year by farmers and stockmen indicate that the destruction of the approximately 50,000 predatory animals under the direction of the Survey resulted in a saving of live stock for the year valued at about $6,000,000, calculated on prices prevailing

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Evidence That Uncle Sam's Hunters Get Results.

Each hunter reports his day's catch and sends to the Biological Survey inspector in charge the pelts or scalps of all animals taken. The salvage of skins having fur value, which are sold at public auction, has already netted the United States Treasury over $240,000.

during the period. The killing of these long-lived predatory animals also results in a saving which is cumulative from year to year. Elimination of predatory animals is saving on the pasture ranges for development to marketable age a great number of cattle, sheep, colts, pigs, and poultry, which formerly fell prey to these animals. This work has so encouraged the live-stock men that they are adding to their flocks and herds as forage for additional animals is provided by the eradication of such range-destroying rodents as prairie dogs, ground squirrels, and related pests.

The COST OF A BUSHEL OF WHEAT

By F. W. Peck,

Farm Economist, Office of Farm Management and Farm Economics.

HOW MUCH does it cost to produce a bushel of wheat? This question sounds innocent enough. Viewed casually, it does not seem especially difficult. One unacquainted with the uncertainties of farming, and particularly of grain farming, might fancy the farmer figuring out the answer, extempore, on a shingle, as the city dweller might figure up his coal bill on his cuff. As a matter of fact, however, the question is both difficult and important. Of all knotty problems of economics there are few that are more puzzling. In a certain sense, too, it is an insoluble problem, for the conditions of production are so variable that it is not possible to cite any one figure as the cost of a bushel of wheat in a given region.

What About the Average?

It is quite possible, of course, to figure out the average cost of a bushel of wheat for a given region—or for the whole country, or even the world, for that matter—provided the necessary data on cost of seed and labor, use of land, etc., are available, but after such an average is found it is a sort of statistical white elephant. The average does not serve the purpose it is popularly supposed to serve in establishing the right relation between costs and prices.

The average person—that elusive individual whom no one has ever met, because, like the average cost of wheat, he is a mere abstraction—may be evoked at this juncture to ask the natural question:

"Why will it not do to use the average as the measure of the cost of producing wheat?"

Why the Average May Be Misleading.

The answer to this question must be framed with an eye to the fact that the public mind is prejudiced in favor of the average as a statistical yardstick, since it has been so largely used as such. If the average cost were set up as a standard, we would have merely a 50 per cent standard, since the average tends to divide the figures into two groups of about equal size, so that about half the farms concerned show up as producing wheat at a cost above the average and half at a cost below the average. On this basis, if the average cost should determine the price, about half the farmers would be producing at a loss. When the price of a commodity goes so low that production is a fifty-fifty gamble, the tendency for many of the producers is to quit and go to raising some other crop that promises a better chance of profit. The result may be underproduction and a period of higher prices.

Ranges of Costs.

One needs only to glance at an array of actual cost figures to see that the average cost is but one of many costs that must be taken into consideration. During the past year the Office of Farm Management and Farm Economics has gathered cost figures on the 1919 wheat crop from 481 farms located in the six great wheat-growing States of the Middle West—Kansas, Missouri, Nebraska, Minnesota, and the two Dakotas (284 farms in the winter-wheat area, covering 42,714 acres and producing over 635,000 bushels of wheat, and 197 farms in the spring-wheat area, covering 42,847 acres and producing over 362,000 bushels of wheat). A trained investigator visited the farms and obtained from each farmer's records, or from his knowledge of his business, the facts necessary for making a close estimate of the cost of growing wheat on that farm. The average cost per bushel was found to be $2.15. You are asked to consider this average in connection with the following figures showing ranges in cost that entered into the making of the average:

Winter wheat:

Average net cost per acre, $27.80.
Range in net cost per acre, $10.55 to $50.23.
8 per cent of the acreage was grown at from $10 to $20 per acre.
39 per cent at from $20 to $30 per acre.
40 per cent at from $30 to $40 per acre.
13 per cent at over $40 per acre.

Average net cost per bushel, $1.87.
Range in net cost per bushel, $1 to $8.20.

18½ per cent of the wheat cost from $1 to $1.50 per bushel.
45½ per cent from $1.50 to $2 per bushel.
24½ per cent from $2 to $2.50 per bushel.
11½ per cent at over $2.50 per bushel.

Spring wheat:

Average net cost per acre, $22.40.
Range in net cost per acre, $12.98 to $47.84.
23 per cent of acreage was grown at from $12 to $20 per acre.
45 per cent at from $20 to $25 per acre.
25 per cent at from $25 to $30 per acre.
7 per cent at over $30.

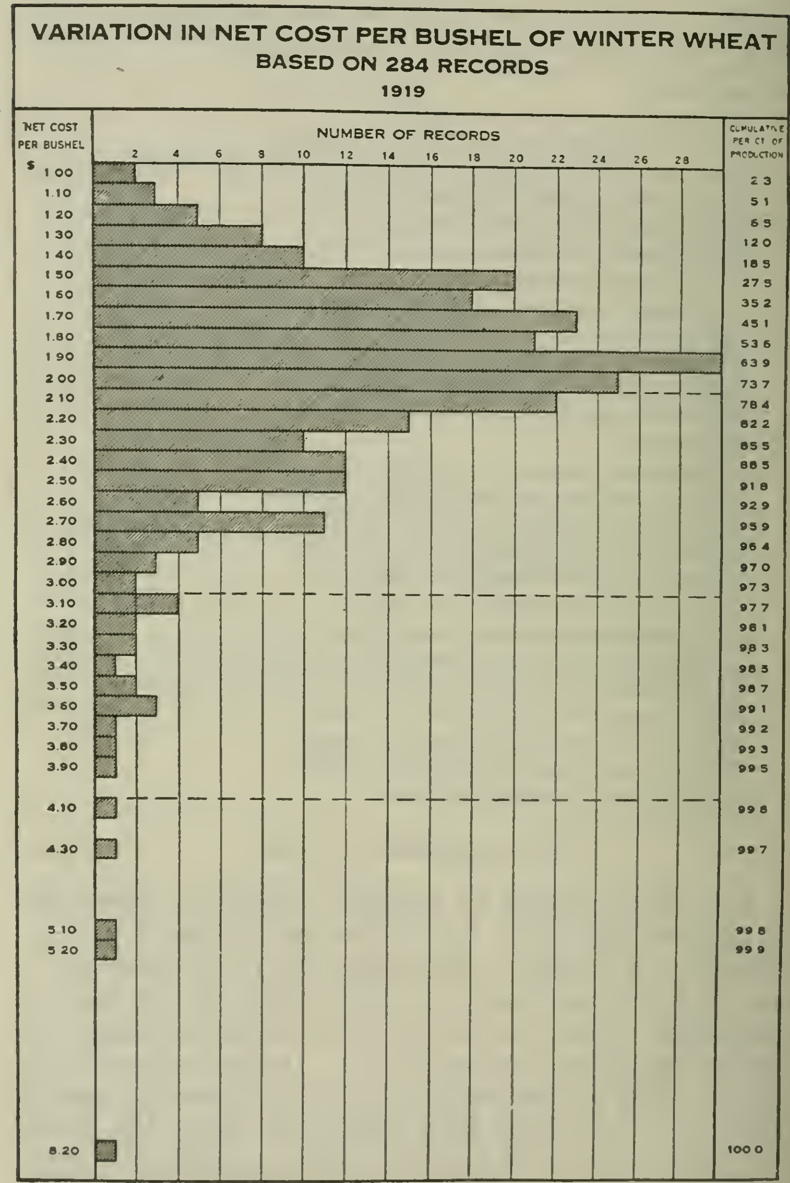
Average net cost per bushel, $2.65.
Range in net cost per bushel, $1.10 to $14.40.

3.2 per cent of wheat cost from $1.10 to $1.50 per bushel.
21.3 per cent from $1.50 to $2 per bushel.
29.4 per cent from $2 to $2.50 per bushel.
22.8 per cent from $2.50 to $3 per bushel.
22.3 per cent at over $3 per bushel.

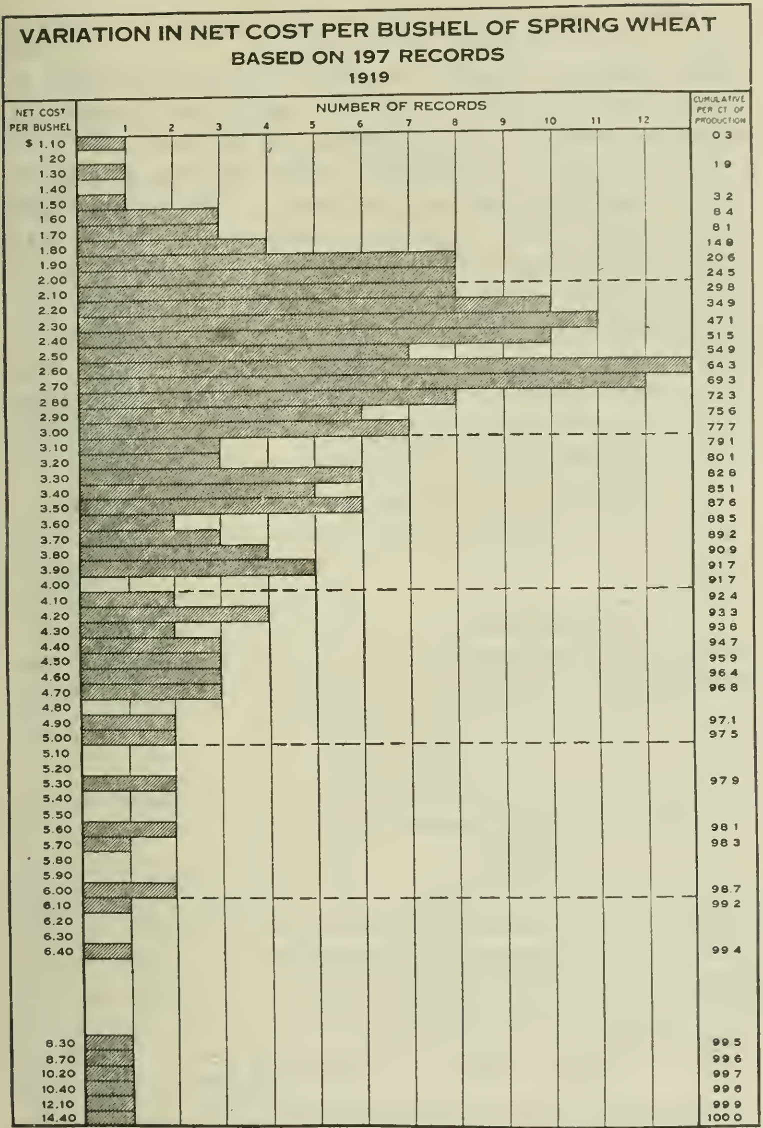
What Makes the Cost.

The principal items of operating expense in producing wheat are: Man labor, horse labor, seed, twine, fertilizer, thrashing, taxes and insurance, machinery, abandoned acreage, and overhead expense. The one item of cost that in accounting practice can not be called operating expense is interest on the land, or land rental. One of the important objects of the cost studies is to bring out the relative profitableness of the various farm enterprises. When the farmer's labor, capital, and land can be used for alternative purposes, and when various amounts of labor, capital, and land are required for crop production, the inclusion of interest or land rent as a cost is very important.

In the winter-wheat area the charge for the use of land was a little less than one-third of the total cost, man and



horse labor about one-third, "materials" expense about one-tenth, and other expenses one-fourth. Without including land rent as a cost, man and horse labor constituted one-half of the cost, materials one-sixth, and other expenses about one-third of the total.



In the spring-wheat area land rent constituted about one-fourth, labor one-third, materials one-sixth, and "other expenses" one-fourth of the total cost. Excluding land rent as a cost, labor constituted two-fifths, materials one-fourth, and other expenses one-third of the total cost.

Low Yields Mean High Cost.

The range in cost per acre was much narrower than in cost per bushel because of the wide variation in yields due to weather conditions or to disease and parasites. A yield per acre below that anticipated when the crop was sown means a relatively high cost per bushel. This is true where the acre cost is low as well as where it is high. It was found that on the spring-wheat farms those who received yields of from 5 to 10 bushels per acre had costs 100 per cent greater per bushel than those who obtained from 15 to 20 bushels, while their acre costs were only 24 per cent less. Similar results were noted in the winter-wheat area.

The wide variation and the range of yield per acre are indicated by the following figures:

Variation in yield and cost of production of wheat.

Item.	Cost per acre.	Cost per bushel.
WINTER WHEAT.		
Average yield per acre, 14.9 bushels	$27.80	$1.87
Range in yield per acre, 1.5 to 28 bushels	10.55 to 50.23	1.00 to 8.20
4 farms, or 1 per cent, obtained less than 5 bushels per acre	16.27	5.14
39 farms, or 14 per cent, from 5 to 10 bushels per acre	21.29	2.63
69 farms, or 24 per cent, from 10 to 15 bushels per acre	25.99	2.04
101 farms, or 36 per cent, from 15 to 20 bushels per acre	30.51	1.77
65 farms, or 23 per cent, from 20 to 25 bushels per acre	32.86	1.53
6 farms, or 2 per cent, more than 25 bushels per acre	39.64	1.47
SPRING WHEAT.		
Average yield per acre, 8.4 bushels	22.40	2.65
Range in yield per acre, 3.5 to 20.8 bushels	12.98 to 47.84	1.10 to 14.00
29 farms, or 15 per cent, obtained less than 5 bushels per acre	19.01	5.21
112 farms, or 57 per cent, obtained from 5 to 10 bushels per acre	22.07	2.98
51 farms, or 26 per cent, from 10 to 15 bushels per acre	24.27	2.08
5 farms, or 2 per cent, more than 15 bushels per acre	23.73	1.48

Another Way of Measuring Cost.

A more stable measure of crop costs than dollars is found in quantities of labor, seed, twine, and fertilizer required per acre. By knowing these it is possible to estimate the cost per acre from year to year in a very satisfactory manner.

It was found on the winter-wheat farms surveyed that the average number of man-hours required per acre was 10, with a range of from 5.4 to 27.4. For the horse labor the average requirement was 24.8 hours per acre, with a range of from 15.9 to 61.6. Estimating the machinery cost by the number of horse-hours required to produce an acre of winter wheat, it was found that this item amounted to $7\frac{1}{2}$ cents per hour of horse labor. In the spring-wheat area fewer hours of both man and horse labor were required. On the average, but 7.4 man-hours were required, with a range of from 3.6 to 19.1. The average horse labor required was 22.1 hours, with a range of 13.4 to 45.8. The machinery cost on the spring-wheat farms amounted to 8 cents per hour of horse labor.

There was little variation in the quantity of seed used per acre. The range for the winter-wheat farms was 0.8 to 1.4 bushels, with an average of 1.1 bushels, and for the spring wheat farms 1.2 to 1.4, with an average of 1.3.

There was also a relatively small variation in the use of twine per acre. In the winter-wheat area the average acre requirement was 2.8 pounds, with a range of 2.3 to 3.7. On the spring-wheat farms the average was 2 pounds per acre, with a range of 1.3 to 2.2.

These are concrete examples of basic requirements. There is need of much more study along this line, that we may accumulate a mass of fundamental figures for use in estimating future costs.

The Bulk Line.

It will be seen, in the light of the foregoing data, that it is not possible to give an off-hand answer to the question of the cost of a bushel of wheat. It is possible, however, to present cost figures that will be of great value to individual farmers in reorganizing their lines of production, in reducing certain items of cost, and in testing the efficiency of their operations. From the consumer's standpoint cost figures show problems of the producers and emphasize the importance of a price which will maintain a continuous and steady supply of food.

The Office of Farm Management and Farm Economics tries to present its cost figures so that a complete picture of the range of individual costs can be obtained at a glance. From the presentation of a range of costs of any product at various cost intervals it will appear that an adequate production will not be forthcoming if the price at which the crop is sold approximately represents the average cost.

Usually 40 to 50 per cent of the production is produced at costs above the average. It follows that one must consider the cost that is representative of the "bulk" of the production of a given product in order to arrive at a cost figure that approximates what the price should be to maintain the industry on a proper basis. This consideration has led to the development of the "bulk-line" theory of cost in its relation to price, which has assumed an important place in the field of economic research.

The "bulk-line" theory is a modification and attempt at practical application of the "marginal cost" theory. For purposes of convenience the "bulk line" has sometimes been drawn to include 85 per cent of the production, but this is an arbitrary figure. In reality the position of the bulk line varies with different commodities and from time to time according to the alertness with which farmers adjust their production to market conditions. The "bulk-line" cost corresponds to the long-time average price which is essential to stimulate the production of that quantity of the product which the market demands. (See charts.)

Our studies thus far made of cotton, winter-wheat, and sugar-beet costs show that the price received by the producers in 1918 and 1919 approximated a "bulk-line" cost of from 75 to 80 per cent of the product produced on those farms.

Merely a Beginning.

It should be borne in mind that all the figures thus far available on cost of production represent merely the first efforts of research along this important line. Certain State colleges have conducted investigations in cost of production, and the Federal department has tabulated cost data on wheat, cotton, tobacco, fruit, sugar beets, and live-stock products; but many more data than are yet available for these crops and other farm enterprises should be gathered, analyzed, and interpreted to bring out existing facts in the cost problem.

HOW *the* PUBLIC FORESTS ARE HANDLED

By Herbert A. Smith,
Assistant Forester in Charge of Public Relations, Forest Service.

IF YOU go into almost any city west of the Great Plains and pick up the telephone book, the chances are you will find a number entered in it for the "Forest Service." And if you go to the address recorded with the number you will probably arrive at an office building in the business part of the town, within which somewhere is a glass door carrying the name of a National Forest.

There are such offices in Seattle, Portland, and Los Angeles; in Denver and Salt Lake; in Missoula, Mont., and in Phoenix, Ariz. Also there are National Forest headquarters in dozens of little places of which you may never have heard. There is Austin, Nev., an old and almost deserted mining camp, reached by 109 miles of narrow-gauge railroad on which trains run three times a week; and Widtsoe, Utah, a hamlet of about 15 houses, 60 miles from a railroad; and Kanab, in the same State, 135 miles from the nearest railroad, and often virtually cut off from the world. And so on, a hundred and forty-odd of them in the West, all told, and in all kinds of places.

Fifteen years ago almost all the Forest headquarters were in little settlements or out-of-the-way towns close to the Forests themselves. But for the better service of the public it has been necessary to move them, where possible, to more accessible points. For the forest supervisor is first and foremost a business man, the local manager of an important enterprise—the handling of some million acres of land permanently devoted to the advancement of the general welfare.

His duties as manager are partly those of an executive in charge of a property which must be protected, developed, and improved. But they are also very largely those of a sales manager. What he is engaged in selling, however, is something more than the things that bring in money to the Government. It is service—to the individual, the community, and the Nation.

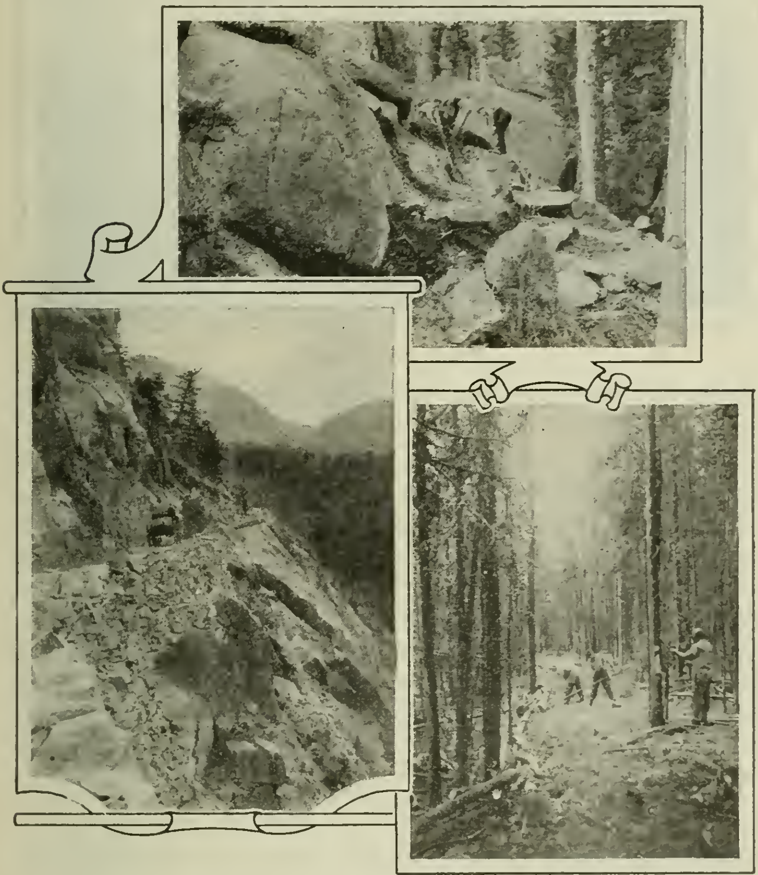
Let us go in through the glass door and have a look at the supervisor. We can expect to find a man between 30 and 45 years old—probably lean, and certainly with a complexion that sun and wind have colored; an outdoor man, yet an office man, too; surrounded by files, with a stenographer to help handle his mail, and probably a clerk or two more—though he is quite capable on occasion of pounding out his own typewriting, after the fashion of the self-taught; and with a storeroom handy somewhere, either on the premises or in quarters not far away, in which is a varied equipment of Government property—from shovels and axes to surveying instruments, and from blank forms for timber-sale records to telephone wire and split tree insulators.

The School of the Woods.

The supervisor may or may not be a college graduate who has prepared for his profession as would an engineer or a student of agriculture at a State university; but he is always a graduate of the school of the woods. Over one-third of the 152 supervisors have been through a professional school of forestry. But all should be counted technical men, for to be qualified for their jobs they have had to learn through years of service the practice of forestry, as it is applied on the National Forests.

Before finding out just what this means, we may profitably note what sort of business goes on in the supervisor's office. On his desk is his morning's mail—perhaps 50 or 60 letters.

if it does not happen to be a busy time. Some are from people whose homes are within or near the Forests and who have written for a permit to cut some "free use" timber, for fuel, fencing, or lumber, or who want summer employment as fire



Opening the Way to the Back Country.

To fight fire, to get out timber, to open the way to the traveler and the settler, Forest Service officers are constantly at work pushing forward roads and trails into the wilderness.

guards, or who are not satisfied with the way the local ranger is dealing with them. For we must remember that our general sales manager for the Forest, in the person of the supervisor, is not the man who does most of the actual "selling." The men in first-hand contact with the local public are the

A Ranger Station.

The Forest Service believes in doing business on the ground, and much of the Forest business is in the hands of the ranger, who is in direct contact with the local public.

forest rangers—a goodly body, all in the classified civil service and therefore selected on the basis of proved qualifications.

The forest ranger has almost become famous, collectively speaking, in the West, and even in the East. That is partly because he is a somewhat picturesque and romantic figure as well as a highly useful citizen and public officer. He is, indeed, in a sense the keystone of the Forest Service arch: all the rest of the administrative organization leads up to him, and he is the final unit that completes the system.

Illiterate and Angry.

Since the rangers are the actual "salesmen" of service to the local public, if they don't mind their p's and q's the supervisor quickly hears of it—and very likely also if they do. Here is a letter on the supervisor's desk, for instance, breathing fury. The writer is illiterate, but voluminous, after the fashion of the man whose grievance rankles within him. The ranger, it seems, has been marking timber to be cut by a lumber company, and has marked some on the letter writer's group of mining claims. The charge may be true—even a woodsman may sometimes miss the evidences of location that

A Forest Ranger.

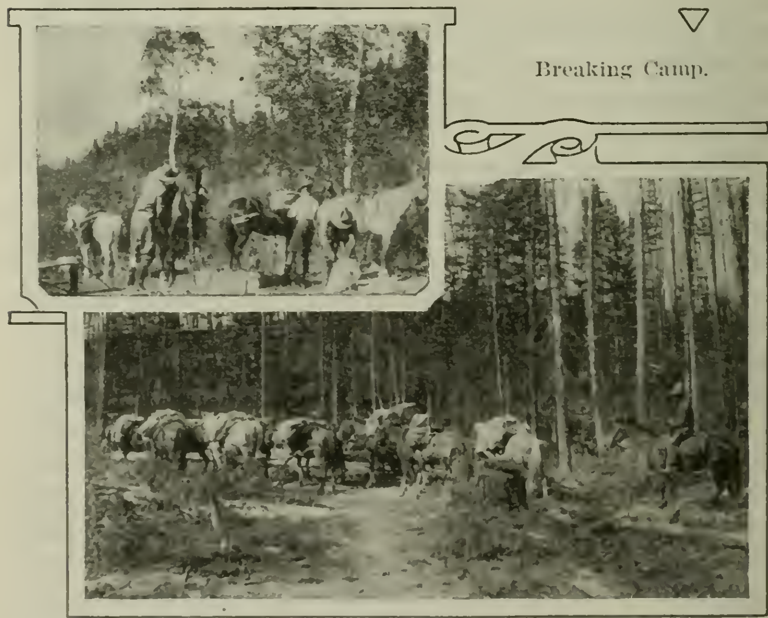
A somewhat romantic and picturesque figure as well as a highly useful citizen and public officer.

the mining laws require. On the other hand, the claims may prove to have been illegally staked out after the timber sale was made, at a place where they will be most in the way or will include some of the choicest stand, for the thrifty purpose of being bought out.

Here is a letter asking the supervisor to attend a meeting of local citizens, at which will come up some road project requiring Forest Service cooperation. Other letters are from points outside the State. An eastern sportsman wants to know where he will find good camping and fishing, and by what trails he can get there, and what the State fish and game laws are; or perhaps an officer of a paper-manufacturing company is inquiring about the suitability of some large body of timber for the supply of a pulp mill; or there is an application from a deluded would-be settler who imagines that the wild, rough, high-lying mountain lands typical of the National Forests need only to be cleared to become like the farms of the East, and who supposes the supervisor can practically hand him out a homestead by return mail.

Other letters come without having to pay postage—official letters, from the supervisor's subordinates, or from the district forester's office. If the latter, they contain instructions, or approval of plans submitted, or perhaps word that the supervisor is to be ready on a certain day to take an expert on timber operations, or grazing, or road building out on an inspection trip. The inspection will be made by one of the specialists attached to the district forester's staff—or possibly by the district forester, or by one of the assistant foresters from Washington, or even the Forester himself, the "Big Chief" in the eyes of all his field men. For the Forest Service organization does not set up two classes of men, one to sit at office desks and criticize paper reports and generally obstruct and bedevil the field work, and the other to try to get things done on the ground.

The field and office men serve turn-and-turn-about. The supervisor has, if necessary, a deputy supervisor, who changes places with him; when one is at the desk the other is in the woods. In the district offices, into which head up the administration of some 20 individual Forests, no branch of the work is supposed ever to come to a standstill for lack of some one



Breaking Camp.

By Pack Train.

To reach the back country with supplies for fire fighters or to make a timber reconnaissance the pack train is often the Forest officer's only practicable means of transportation.

to handle it; yet every administrative officer must spend a large part of his time in seeing just what has happened, in his particular line of activity, on the ground and in the woods.

The Supervisor Knows.

But we have let our attention wander from the supervisor. He is talking with a little group of substantial looking, typical western men—three cattlemen who have come to protest because they have been told they will have to allow some sheep to feed, jointly with their cattle, on the part of the Forest range they have been using. "We won't have sheep around. Cattle won't feed where sheep have been." The supervisor listens patiently. But we soon see that he knows his facts, and has not made up his mind without good reason. "There is feed there that is going to waste. Your cattle won't eat it, but sheep will. It isn't true that sheep on the range spoil it for cattle. That is an exploded idea. Our tests have proved the contrary. Why, up in——."

But we need not listen further to the argument. The cattlemen will yield in the end. Of course, they can appeal from the decision of the supervisor, if they wish, to the district forester, and, if their grievance is important enough, to the Forester, and as the court of last resort, to the Secretary of Agriculture himself. But appeals are not very numerous, for generally speaking the forest supervisor is able to make the other fellow see that he is right. He has a big advantage, for one thing, because of the esteem in which he is held locally for his fairness, capacity, and leadership.

National Forests Have Become Popular.

Now the cattlemen have gone, and the supervisor is ready to talk with us. We begin to ask him what the western public generally thinks of this National Forest business. There used to be a great deal of criticism of it. The supervisor smiles. He has been through all that—began as a ranger in the days when a forest officer in that country couldn't go to a dance without having it made quite obvious to him that his room was preferred to his company.

If we could get the supervisor to talk with us long enough (the best way would be to ride with him for three or four days as he travels over the Forest on his official business) what he would say might boil down into something like this:

Much of the early opposition to the National Forests was based on the feeling that the system was un-American. It was held that private enterprise could develop to best advantage the great resources involved. On general principles, the average American has a healthy dislike of too much government; and further, experience gives him good warrant for skepticism of our ability to get public business taken care of both cheaply and well. But the National Forests have become popular. Western public opinion expresses itself vigorously from time to time in their favor. Any attempt to take the back track and abolish the forests would certainly call forth bitter opposition. The way in which the business connected with their administration is handled, the quality of their personnel, and the cooperative and beneficial relationships maintained with local communities and community interests are a standing subject of comment and praise. The evidence is overwhelming that, in the eyes of the West, the National Forest enterprise has made good.

The National Forests have for their primary purposes timber production and the control of run-off. In the words of the law, they are "to furnish a continuous supply of timber for the use and necessities of citizens of the United States." The same act specified also that they may be established "to improve and protect the forest" and "for the purpose of securing favorable conditions of water flows." But they are to be open to the public "for all proper and lawful purposes;" and one of the objects of their establishment is to "regulate their occupancy and use." In short, they are to serve the interests of the people in the broadest fashion.

All Kinds of Range.

When the Forest Service took charge of the Forests in 1905 the most pressing administrative problem was what to do about grazing. Unregulated grazing was proving seriously injurious both to the growth of timber and to water supplies, and the range itself was fast losing productive capacity. Many persons advocated entirely closing the Forests to the grazing at least of sheep. No one would think of suggesting such a policy now.

The timber is still too far distant from local markets and means of transportation to the general markets of the country to have come into full demand. The West has not grown up to it. But the pasturage is fully utilized, under methods which safeguard the tree growth, hold in check erosion, prevent interference with the purity and regularity of streams, and are bringing back the depleted ranges to their full productive power.

Within the National Forests, reaching as they do from Mexico to Canada, from almost sea level to the summer snow banks, and from the desert to the well-watered mountain meadows where the first cattle grazed knee-deep in luxuriant verdure, the widest diversity of conditions exists. There is natural sheep range, natural cattle range, and natural goat range; there is range on which it takes 50 acres of land to support a cow, and range which at its best might carry 80 head of cattle to the quarter section through the summer season; there is winter range, summer range, and yearlong range; there is range on land where the tree growth is no more than scattered brush valuable only for water protection, range on denuded foothills and mountain slopes, in dense brush, in open parks, in timber that grows wide-spaced and high-crowned so that one may see through it for a mile, and in timber so dense that sheep can scarcely penetrate it.

But this is only the beginning. When grazing commences, a disturbing factor is introduced. More than 5,000 different species of range plants have been identified. The live stock have their preferences, and feed most eagerly on certain selections from nature's varied bill of fare. Their choice changes as the advancing season alters the menu—as early plants mature and later ones spring up. The grazing animals may crop the seeds, for their concentrated food value, or the tender foliage of an earlier stage of growth. Their hoofs trample, cut, pack. They may loosen, or compact, the soil; they may facilitate or almost wholly prevent reforestation; but always there is an effect on the forage crop. Broadly speaking, the more valuable plants tend to disappear, less valuable or worthless plants to gain ground, and the vegetation to thin out.

To prevent this deterioration and make the best use of the range calls first of all for knowledge of the actual conditions on each range unit. Is its carrying capacity on the decline? If so, why? Because the stock come on too early in the season, or stay on too late? Because they graze too much on certain parts of the range? Can they be better distributed by a different method of salting, by new water development, by drift fences, or by some other change in the method of handling?

Some Ranges Are Best for Cattle.

The goal of range management on the National Forests is the best use of all the forage by the number and kind of animals best suited to each kind of range.

Or must the number be decreased or the grazing season shortened? Again, the range may be depleted because of past overgrazing, so that although not now declining it is much below par. How can it be restored to normal productivity with least disturbance to those dependent on continuous use of the area? Or would it perhaps do better if used by a different class of stock—by cattle instead of sheep, or vice versa.

Science and Practice on the Range.

The whole system of grazing is directed by grazing experts—men who combine practical knowledge of the range live-stock industry with scientific training. The local forest officers work under and with them to apply the methods which the experts prescribe. The condition of each range is closely watched, and reported annually. Decision is then made how many stock can safely be admitted the next season, and whether the plan of management can be bettered. If reductions are necessary, they are made with as little disturbance of the business of those using the range as possible; for the best interests of the country at large require a live-stock industry that is reasonably stable.

Range Control Keeps the Live-Stock Business Going.

Protection of the range against overgrazing has in itself been a great stabilizing factor; live-stock men in the West now recognize that but for the system of grazing control applied on the National Forests, most of them would long ago have had to go out of business for lack of forage. But stability requires not only that the forage keep on growing; it requires also that those who wish to put their money into live stock shall have reasonable assurance that they will not suddenly be put off the range. Otherwise the business would be highly speculative, haphazard, and hand-to-mouth.

When the forest supervisor gets in his applications for use of the range, the chances are that they call for permits for more stock than the number fixed. Some of the users of the previous year wish to expand their business. New men have come in, developed ranches near the Forest, and want to share in the grazing privilege. How can stability be reconciled with further development? And how be fair to those already in the business while giving a square deal to new men equally entitled to the benefits of the public resource?

The forest officer is not embarrassed when confronted with such a quandary. To him it is no quandary at all; the regulations tell him just what he should do. No permanent monopoly of the forest ranges by a favored few is allowed; the big man must make room for the small, within reasonable limits. A carefully worked out system of preferences makes the whole matter simple. The reductions required of the larger owners are made on a sliding scale which operates to curtail the number of stock allowed them gradually and without unnecessary hardship. Preference is given to citizens over aliens, to those regularly engaged in the business in that locality over transients, to owners of improved ranch property over stockmen who have not such property, to ranch owners who are actually residents of their ranches over nonresident owners.

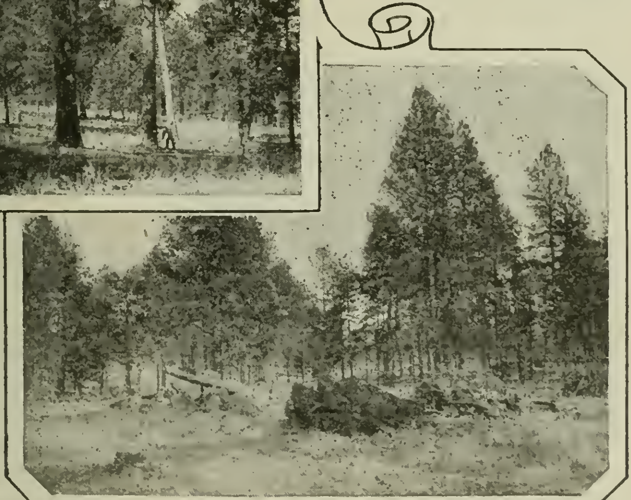
The near-by home builder of moderate means who raises cattle or sheep in connection with other farming, who needs to use the public range for summer pasturage, and who has no other good way to get his hay or grain to market than to send it on the hoof, is given the highest preference. What he does not require, others in graduated order are welcome to utilize—and more than welcome. To open feeding grounds for them roads and bridges are built, driveways located, and the remotest corners of the Forests ransacked in the search for new grazing areas. Meanwhile intensive study is being given to ways of increasing the forage yield and the effectiveness of its utilization.

Prize Winners Off the Range.

It has become common for live stock from the National Forest ranges to top the market in the fall, win prizes at live-stock shows, and go straight to the packers instead of being sold for "finishing" as farm feeding stock. Not scrub stock but high-grade, heavy, well-conditioned animals have become the rule. At the same time the number of animals grazed on the Forests has been steadily rising. On the average the carrying capacity of the range has been increased by something like 30 per cent in the 16 years since the Forest Service took charge of them. It is not strange that western cattle and sheep industries have been converted from opposition to enthusiastic advocacy of regulated grazing by the Forest Service.

For a Stay-at-Home Lumber Industry.

When we turn from the range to the timber, certain parallels are disclosed. Here also protection of the public against monopolistic control is a part of the policy. The law requires that when National Forest timber is sold for commercial use its fair market value must be obtained. The timber is sold on the stump for not less than the appraised value; and every effort is made to secure competitive bids in all commercial sales. Large sales are extensively advertised, and before a contract is awarded all possible opportunity is given prospective purchasers to become familiar with the logging chance in question. But the right is reserved, and on occasion exercised, to reject the highest bid if its acceptance might lead to the monopolistic control of local markets, or if on other grounds the public interests might be unfavorably affected. As a



Using and Growing Timber on the National Forests.

Mature trees, marked in advance by Forest officers, are cut without waste; brush is piled to reduce the fire hazard; and a good stand of thrifty young trees is left to grow for future use.

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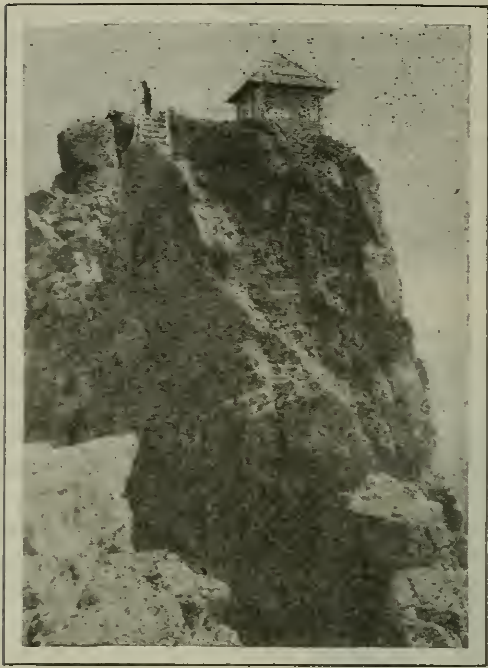


Minutes Count.

A glimpse of distant smoke, a quick calculation to "spot" the fire, a word over the wire to ranger headquarters, and the fight is on.

further protection against monopoly it is distinctly the policy to make sales in such a way that competition of manufacturers for a given market will be developed. At the same time, stability of manufacturing enterprises is provided for by holding for established operators a supply of timber adequate to meet their needs for a term of years; while the cut is limited to what the forests can permanently produce as a sustained yield. In place of a nomadic industry, gutting the country and moving on to new fields of devastation, is substituted one that is meant to continue as long as trees grow and water runs.

This imposes a task for the expert in silviculture, very much like that imposed on the grazing expert. When the Forest Service took the Forests in charge there was scarcely the beginning of a science of forestry in this country. Lumbering interferes with the forest growth in much the same way that grazing interferes with the forage growth. To use the resource so that it would not be impoverished, but improved, was the vital matter.

Laboriously and step by step, the technical practice of forestry has been worked out. Every cutting has become an object lesson and source of new knowledge. Field observations have been supplemented by carefully planned intensive work at experiment stations. Lack of adequate funds has made it impossible to prosecute the experimental studies with the vigor that was needed to build up, as rapidly as it was called for, the basic knowledge of forestry, and curtailed appropriations for the support of this work have recently compelled the virtual closing of most of the stations; but in spite of such obstacles, progress of a notable character has been made.

Fire.

Just as the range had been badly abused before the National Forests were created, the timber had been ravaged by fire. Forest fires had set their mark on the western forests even before the first white settlement of the country began. These early fires were sometimes of Indian origin, but were largely caused by lightning. As the whites moved in, fires became more frequent. There was little sense of a personal responsibility for protection of the forest resources. Hunters and trappers, prospectors, sheep herders and cowboys, lumbermen, settlers, railroads, and recreation seekers all contributed to increase the danger.

There were many great fires. The earliest explorers ran into some of them. In the West the forests normally face each year a dry season. Frequently the summer drought is severe and prolonged. Electrical storms, with little or no rain, are common, and one such storm may start from a dozen to thirty fires within an hour or two. These lightning fires are most common in the high mountains, where their control is made difficult by remoteness and inaccessibility. They may burn for days and sometimes for weeks before an adequate force of fire-fighters can reach them.

A Smoke.

The smoke from a burning forest is visible many miles away and gives the lookout on the peak his first warning of the fire.

The great fires left extensive areas of desolation. Less spectacular but no less harmful were the thousands of small fires that burned each its few acres of heavy timber or ran unchecked over the surface, killing mainly seedlings and young growth. The oftener surface fires run through timber the thinner the stand becomes. The old trees are left without a normal crop of young trees coming on to take their place, and a depleted, impoverished, and in the end very likely a ruined forest is the consequence.

Fires not only interfere with the production of timber, but also impair, and may destroy, the capacity of the forest to protect watersheds. The first task imposed on the Forest Service when, in 1905, it was placed in charge of the National Forests was to devise and apply effective methods of holding down the fire damage.

A Tough Job.

The task was immense. There was nothing to pattern by, and worse than nothing in the way of a field organization to work with. "Political" appointees had been the rule, almost to the time when the "forest reserves" were transferred to the care of the Forest Service; for the field force had not been put in the classified civil service until December, 1904. Public sentiment with regard to the reserves was at best inclined to be indifferent, if not suspicious; in many regions it was strongly hostile. The business methods in vogue were archaic and cumbersome; the organization ill-adapted to its tasks; the personnel neither commanding nor on the whole deserving public confidence. With regard to forest fires, the prevailing sentiment in the West was that they could neither be prevented nor effectively controlled, and a large part of the population saw no reason why they should be. Settlers set fires to clear land, and let them run; miners set them to make prospecting easier; sheepmen and cattlemen set them to get more forage. Congressional appropriations for the protection of the "reserves" were grossly inadequate. In short, there was neither the machinery for fire control, nor knowledge how to bring control about, nor funds for bringing it about, nor any great public desire that it be brought about.

And every summer, from the Pacific to the Great Plains, a large part of the country was dim with haze or shrouded in smoke.

With notable swiftness the whole situation began to change. Crooked and inefficient job holders were hunted out of the inherited field force; business methods were vigorously overhauled and organization was improved; the technic of fire suppression was learned in the hard school of experience; an aggressive campaign of public education was waged. While 16 years has not sufficed to bring about complete

Backing Up the Fire Fighters.

Equipment and supplies are sent forward by pack train from the base camp to the fire lines.

protection to the public forests against the fire hazard, the gains made are of a profound and revolutionary character. Essentially the battle has been won; what remains is to press the victory home.

The National Forest protective force knows how to handle fires and is competently organized. It has suffered from too frequent changes in personnel, due to inadequate pay, and the force is still in many regions too small. But the greatest deficiency is in the equipment of the Forests with what is necessary to detect and get to the fires quickly, so that they can be put out while still small. More lookout stations, telephone lines, and especially more roads and trails are badly needed. The outlay required for so huge an aggregate area is, of course, too great to enable these improvements to be supplied all at one time. Each year sees their construction carried farther.

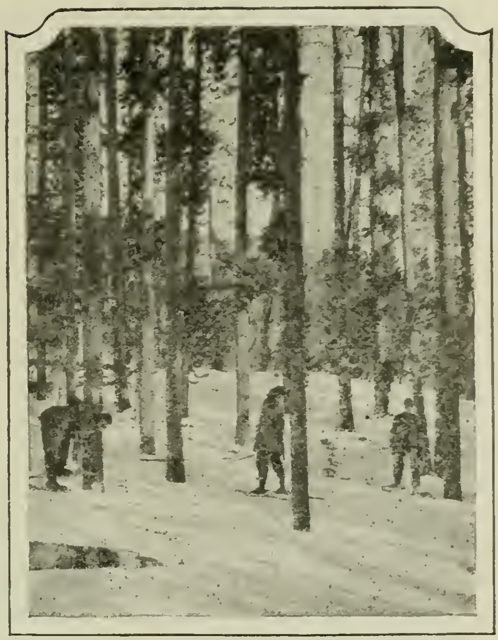
Getting the Public to Help.

Perhaps the most notable single achievement has been the conversion of western public sentiment with regard to fires. Fifteen years ago most of the sentiment against fires was in the East. To-day it is in the West. The value of the strong western support of the policy of protection, and of the readiness of the public to cooperate both in preventing fires and in putting them out, is beyond estimate. This is due partly to the demonstration by the Forest Service that the fire losses can be held down and to the beneficial results that have followed, but it is largely due also to the unremitting campaign of education that has been waged by every available means. This campaign must be nation-wide if the country is to have adequate permanent forests.

Throughout a large part of the West, and in the National Forests that are strung along the Appalachian Mountain system from Georgia to Maine, the problem of protection is now well in hand. In the three Pacific Coast States, however, and in northern Idaho and western Montana, the conditions are much less satisfactory. This is the portion of the country in which the worst fires occur. It is also the part of the country in which is concentrated one-half of our remaining stand of timber.

All the conditions that make fire control difficult are in these regions accentuated and combined, so that the problem of protection is presented in its most acute form. The summers are usually so dry that for months the surface litter and vegetation are like tinder; the timber stand is of conifers; the country is very mountainous and broken, little settled, undeveloped, and lacking in means of communication and transportation; lightning storms are common and severe; the areas to be protected are immense; and the funds available for protecting the Forests are exceedingly inadequate. Here are the last great strongholds of the arch enemy. What is the prospect for their reduction?

Perhaps that can be accomplished only by the method of slow siege. Season by season, the roads and trails, lookout stations, telephone lines, and similar permanent equipment will be carried farther into the mountains and increased in number. Thus the approaches will be driven forward, the outposts strengthened, and the foe weakened and pressed back. The men employed in constructing these improvements will furnish potential fire-fighting forces close to the advance line. Ahead of them will be the scouts and skirmishers—"smoke-chasers," patrolmen, lookout-men holding their lonely vigils on commanding peaks and turning in the alarm when their telescopes bring to view the tell-tale smoke banners of the enemy. Behind the front-line men there will gradually press in potential supporting columns—logging crews come to harvest the ripe timber for sawmill or pulp, miners opening a new camp, ranchers here and there in the mountain valleys, railroad construction crews, little settlements, villages, towns. Dangerous old burns covered with "jackstraw" dead-and-down timber will be made innocuous, either by fire lines run about and through them, by utilization, or, if there is no better way, by letting fire take its final toll and utterly consume the débris. Sheep and cattle will be got



National Forest Timber is Used.

Mature timber on the National Forests is placed on the market and bids are accepted from responsible operators. The trees to be removed are marked in advance and the cut is limited to what the Forest can produce permanently as a sustained yield.

into portions of the forests now inaccessible to them, to eat off the forage before it becomes fuel to spread the flames, and sometimes to create fire lines through their driveways, or to trample down and break the smaller fallen wood. And as the interests of the public in the Forests increase through economic development, there will be more and more forest officers on the ground, more and more money appropriated to hire guards, a more and more vigorous pushing of improvement work. Progress will be at an accelerating rate; it will gain by its own momentum, and conquer the last ground with a rush. It is the first step that is hardest to take, and therefore really counts most—and already there are many steps behind.

Sound Science and the Spirit of Public Service.

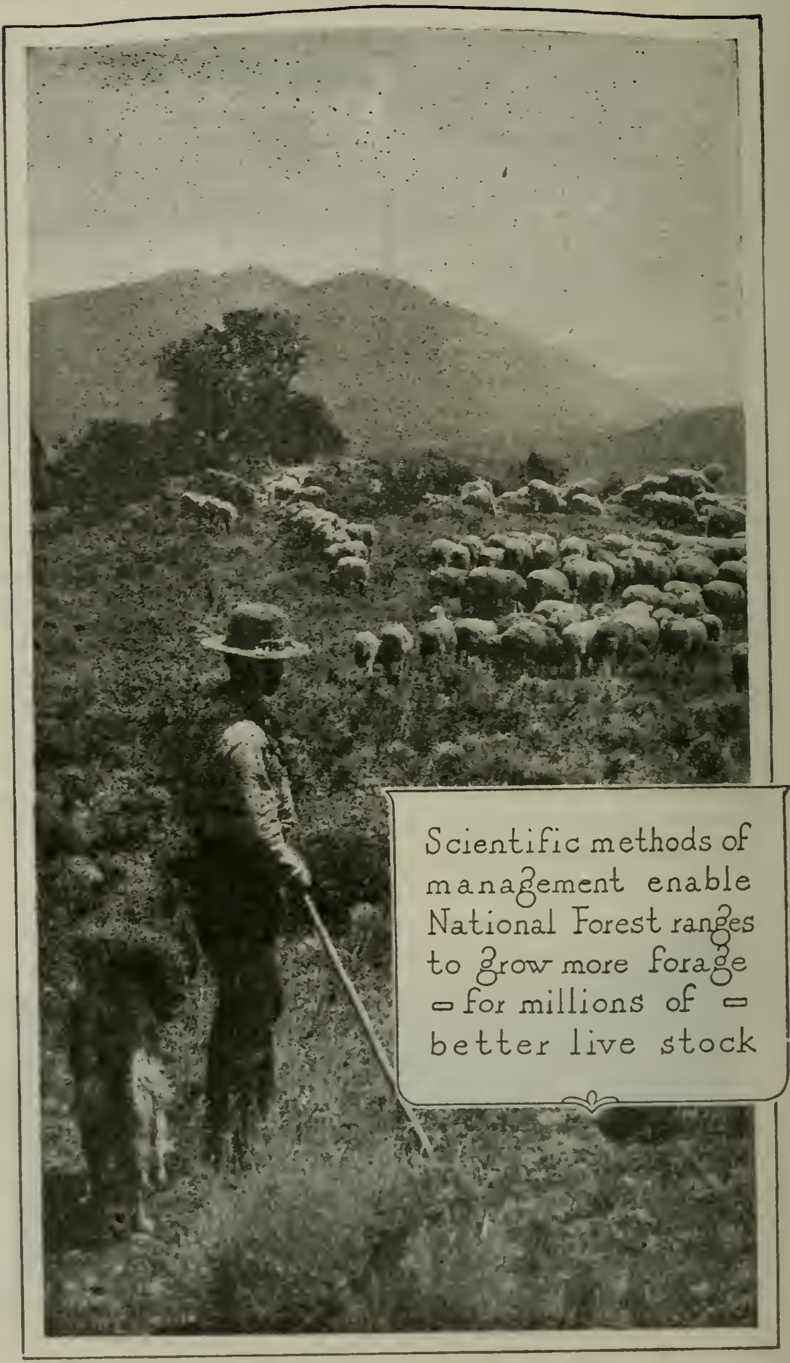
There is much else that would have to be told to make the story of how the National Forests are handled anything like complete. It would be necessary to tell of their growing use for recreational purposes; of their relation to the mining industry, which may freely develop their mineral wealth and obtain from them both wood and water essential to mining operations; of their relation to many other industries, and how their management is shaped with a view to making all industries dependent on them stable and permanent. But the essence of the whole matter may after all be summed up in a very few words.

On February 1, 1905, the Secretary of Agriculture, James Wilson, addressed a letter to the Chief of the Forest Service, which said in part:

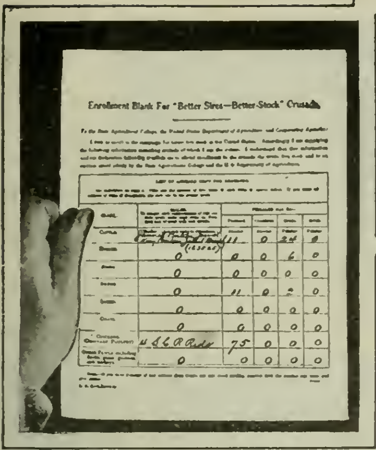
> In the administration of the forest reserves it must be clearly borne in mind that all land is to be devoted to its most productive use for the permanent good of the whole people and not for the temporary benefit of individuals or companies. All the resources of forest reserves are for use, and this use must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources. * * *
>
> You will see to it that the water, wood, and forage of the reserves are conserved and wisely used for the benefit of the home builder first of all, upon whom depends the best permanent use of lands and resources alike. The continued prosperity of the agricultural, lumbering, mining, and live-stock interests is directly dependent upon a per-

> manent and accessible supply of water, wood, and forage, as well as upon the present and future use of these resources under businesslike regulations enforced with promptness, effectiveness, and common sense. In the management of each reserve local questions will be decided upon local grounds; the dominant industry will be considered first, but with as little restriction to minor industries as may be possible; sudden changes in industrial conditions will be avoided by gradual adjustment after due notice, and where conflicting interests must be reconciled the question will always be decided from the standpoint of the greatest good to the greatest number in the long run.

These were the principles which the Forest Service was instructed to put into effect when it took charge of the National Forests 16 years ago. They have never been changed. To the extent that they have been faithfully carried out, the Forest Service has been successful. For that measure of success it is indebted to the fact that, as a unit of the Department of Agriculture, it has been able to bring to its varied tasks the methods and spirit of agricultural science (of which forestry is a part) and to apply them in the service of the public interest. Under no other department of the Government could it have accomplished its tasks with equal success. It can continue to serve the public with thorough efficiency only so long as its work continues to be guided by the same combination of sound science and the spirit of public service. Forestry must be applied by foresters and its kinship with agriculture should never be forgotten.



Scientific methods of management enable National Forest ranges to grow more forage — for millions of — better live stock


Enrollment Blank For "Better Sires—Better Stock" Crusade

FROM SCRUBS TO QUALITY STOCK

By D. S. Burch,
Editor, Bureau of Animal Industry.

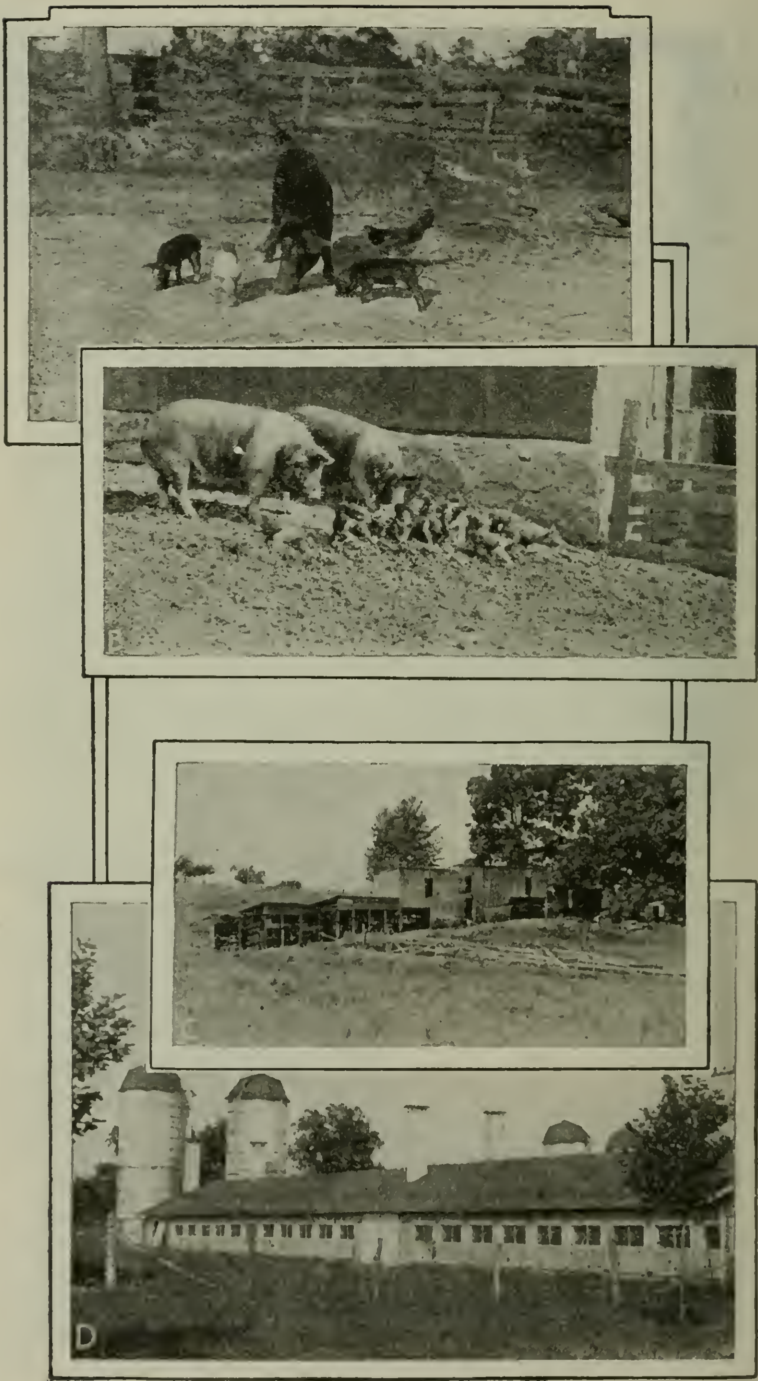
When you start to improve live stock by grading up with purebred sires you will not stop with merely the sires, nor will you limit yourself entirely to the grading process. You will acquire some purebred females and become, in a degree, a breeder of purebred live stock as well as conducting the grading-up process with the other females. More than that, you will acquire several times as many purebred females as you have males.

These results happened on more than 3,200 farms in the United States where purebred sires are used. Moreover, the statements hold true for all classes of live stock.

In the case of cattle the owner of a purebred bull acquires on an average seven purebred cows besides his other cows that are not purebred. With swine and sheep for every purebred male used there are about eight purebred females; and with poultry the proportion is 1 to 13. For horses the ratio is not so large—one stallion to only two mares—yet the principle of getting purebred dams to go with purebred sires still holds good.

Better Stock of All Kinds.

These figures represent the experiences of 3,243 live-stock owners who are cooperating with their State agricultural colleges and with the United States Department of Agriculture in the "Better Sires—Better Stock" campaign. This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is an educational movement to improve the quality of live stock in the United States by the use of good purebred sires. It involves the pledge of a live-stock owner to use such sires for all classes of live stock kept, and upon receipt of this pledge, together with the blank on which is listed the number of animals kept for breeding, the department issues a suitable emblem of recognition.

The principal part which the various agricultural colleges and the Department of Agriculture play in the better-sires drive is to give out information showing the benefits which purebred sires bring. Whatever action live-stock owners themselves take is a matter prompted by their own best judgment. It is their judgment, their decision, and their ultimate action which are the basis for the figures already given. The noticeably large use of purebred females is an unexpected result of the better-sires movement and contributes largely to its success.

The trend toward better live stock is shown in a striking way by the total figures representing enrollment in the better-sires campaign for slightly over a year.

What the Pictures Show.

A. Piney Woods Rooter and Her Litter of Three.

Although some swine raisers, especially in the prominent swine-raising States, have never seen a typical razorback, other swine raisers have not seen well-bred swine of good type.

B. Purebred Profit Makers.

An unusually excellent pair of Hampshires with a litter so lively that the camera could scarcely "catch" them.

C. Plenty of Ventilation—Little Comfort.

Poor housing interferes with animal comfort, tends to lower production, and may also harbor live-stock diseases. Better returns from herds headed by purebred sires generally make possible a better class of farm buildings.

D. Good Live Stock Earns Good Quarters.

Light, ventilation, sanitation, and plenty of economical feed—all these combined with good breeding cause live stock to be most profitable to owners.

Quality of live stock used for breeding by purebred-sire owners.

[Based on reports of 3,243 persons enrolled in "Better sires—Better Stock" campaign Jan. 1 1921.]

Kind.	Males (all purebred).	Females.					Total males and females.
		Purebred.	Grade.	Crossbred.	Scrub.	Total females.	
Larger animals (including cattle, horses, asses, swine, sheep, and goats)	8,021	50,213	72,546	22,203	3,849	148,811	156,832
Poultry (including chickens, turkeys, geese, ducks, and guinea fowls)	12,346	159,149	52,584	10,043	4,000	225,776	238,122
Total animals and poultry	20,367	209,362	125,130	32,246	7,849	374,587	394,954

Slightly more than one-third of all the larger female animals kept by purebred-sire users, are purebred.

In the case of poultry, which are more prolific, more than two-thirds of the females kept by purebred-sire users are of pure breeding.

These summaries, in the judgment of specialists in the Bureau of Animal Industry, show the esteem in which farmers of the country are holding purebred live stock. At the beginning of the "Better Sires—Better Stock" campaign a large proportion of the discussion concerning the merits of purebreds originated in the department, but now, like a returning tide, the favorable opinions and reports of success which attend the use of well-bred live stock are rolling in.

Another Page of Live Stock Contrasts.

A. A Scrub Cow.

There is seldom any uniformity in scrub stock. About the only things they have in common are 4 legs, 2 horns, a hide, and a tail.

B. One Result of Tick Eradication.

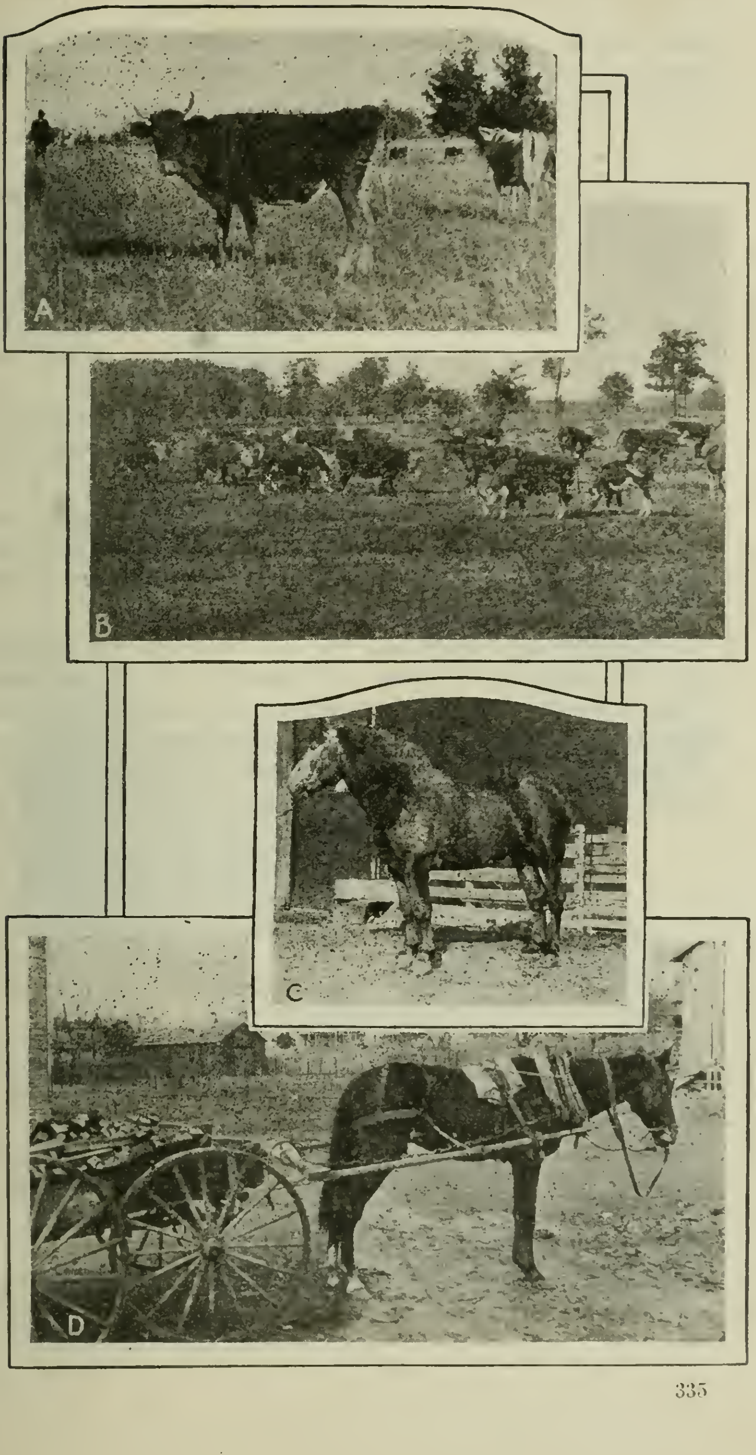
Purebred Hereford cattle in Mississippi. Only a few years ago the State was tick infested. Good breeding stock combined with the control of pests and disease makes possible a great live-stock empire in the South.

C. Where Breeding Means Power.

A purebred Percheron stallion. Sires of this kind result in vigorous, growthy animals.

D. Handicapped by Inferior Breeding.

Poorly bred horses like this one are less valuable for work and bring less at sales than those having purebred ancestors.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These match up so closely with the figures already given that they should interest live-stock owners throughout the country regardless of the kind and quality kept.

What Purebred-Sire Users Say.

A breeder in Nevada remarks, "My steers (from purebred sires) will weigh 100 pounds more at 2 years old than a scrub at 3." "If I had $3,000 to start a herd of good cattle," declares a North Carolina dairyman, "I would put at least 50 per cent in a bull. I claim to have the best bull in the State and am looking forward to his offspring. Get a better sire."

"Use big, vigorous sires and feed well," another breeder urges. "A scrub can't be expected to produce growthy offspring."

"A first-class animal can not be produced without a good sire," remarks a Florida stockman, "but I would urge also better dams. You have never seen a real high-class animal that didn't have a good dam."

A Pennsylvania dairyman who is a member of a cooperative bull association states in a letter to the department. "I have been a member of the Grove City Holstein-Friesian Bull Association for three years. It is one of the best investments a small breeder can make. I do not believe I would ever have started in purebred stock had I not be-

—And This Stock Also Tells a Story.

A. Barred Plymouth Rock Cock of Good Type.

Poultry of pure breeding and conforming to recognized standards for their breed are known as standardbred fowls, the highest type.

B. The Kind not to Use.

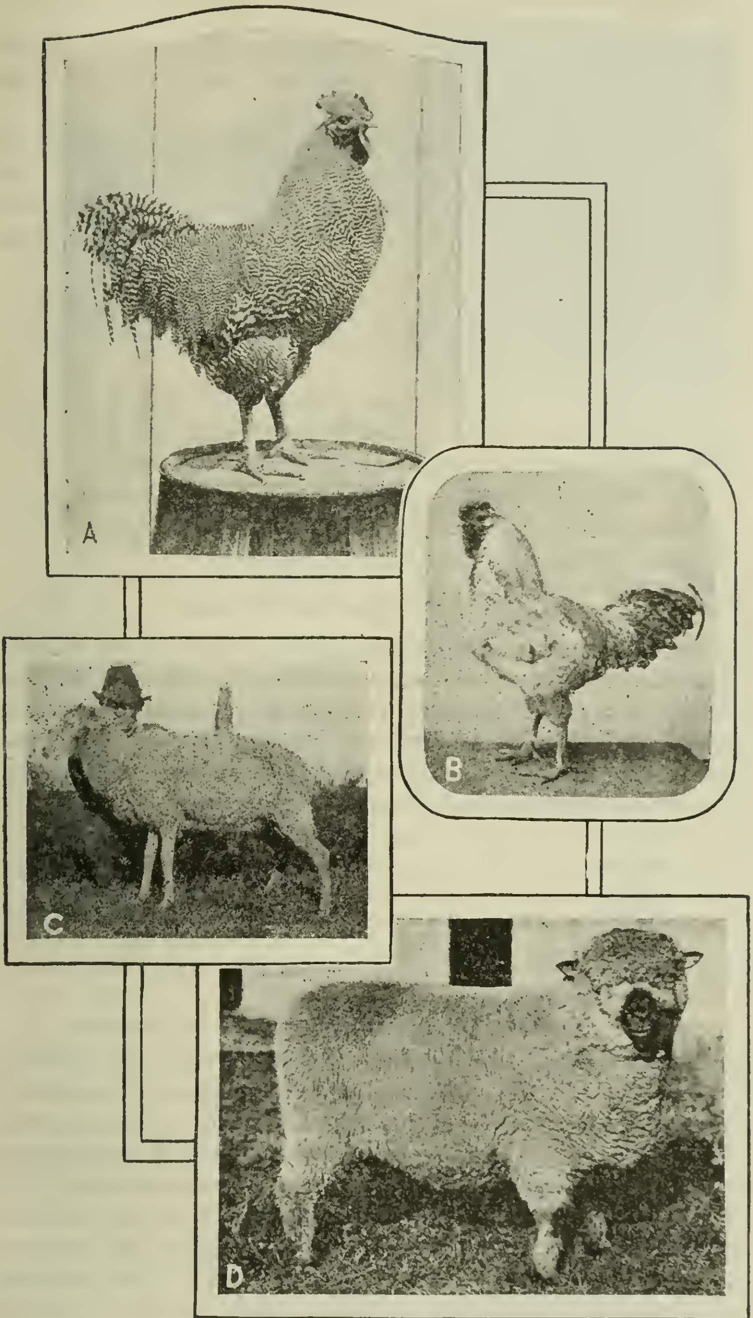
The mixed heredity of a bird like this mongrel means a mixed lot of chickens unlike in appearance and unable to transmit good qualities to offspring.

C. A Scrub Ewe.

This native ewe has undesirable qualities so common in poorly bred live stock. The humped back, long legs, and light growth of wool are in striking contrast with the conformation of well-bred sheep.

D. Good Breeding Means More than "Blood."

In sheep it means more wool, better wool, more meat, better meat, faster growth, greater vigor, and increased profits.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longed to the association. I now own three purebred females and sold one bull calf to almost pay for my interest in the association."

A swine breeder in Washington State tells of breeding an ordinary sow belonging to a near-by farmer to his own purebred boar. "Out of the litter," he adds, "the farmer raised hogs that took first and second prize and junior champion at the State fair."

"To understand how to breed and how to feed," declares a Utah farmer, "will greatly improve the standard of our live stock."

"Use purebred stock, at least purebred sires" is a similar comment from a stockman, who adds, "keep less stock, give them better care, and make twice as much money."

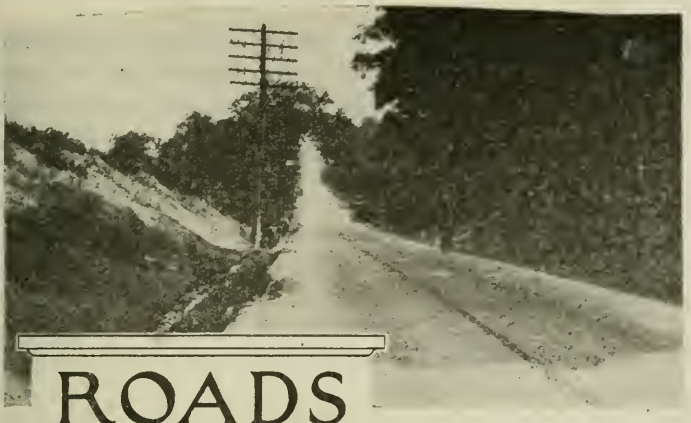
The comments just given illustrate the appreciation of a superior quality of stock by persons who depend on domestic animals for a large part of their livelihood.

Ratio of Sires and Dams.

Developments in the better-sires movement have resulted likewise in figures showing the relative number of purebred males and of all females (including purebred, crossbred, grade, and scrub) kept for breeding purposes. These ratios are based on approximately 400,000 head of stock listed with the United States Department of Agriculture:

Cattle	1 bull to 17.5 cows.
Horses	1 stallion to 17.2 mares.
Swine	1 boar to 11.1 sows.
Sheep	1 ram to 32.2 ewes.
Goats	1 buck to 23.9 does.
Fowls	1 rooster to 23.9 hens.
Other poultry, geese, ducks, turkeys, etc. (average)	1 male to 10.6 females.

These figures, representing the proportion of males to females on more than 3,200 farms throughout the country, show the importance of placing stress on quality in sires. In practically all cases a sire is the parent of a much larger number of offspring than the average female animal. Yet the tendency, clearly shown by the records of the "Better Sires—Better Stock" campaign, to recognize the value of good dams is likewise sound and practical. This tendency is a basis for even more rapid live-stock improvement than the use of purebred sires alone would bring.



ROADS

By H. S. Fairbank,
Senior Highway Engineer, Bureau of Public Roads.

ONE of the advantages of Heaven, according to Milton, is a "broad and ample road." The farmer who has to haul half-loads of produce because of the mud between his fields and the market, or the automobilist who has to pull out of a hole by means of a rope passed around a roadside tree, is excusable if he is tempted to envy the disembodied spirit traveling luxuriously along Milton's star-paved highway. He may even wish himself there audibly and in no uncertain tones. But the reason for this feeling is rapidly passing away. We have entered a new era, in which the bad road is giving way to the good, and the good road is being pushed forward into places where no roads have ever been before. Everywhere in the United States good roads have come to be regarded as indispensable to the welfare of the community. State and Federal Governments are cooperating in a great nation-wide endeavor to change the country thoroughfare from "a rough, a weary road" to a smooth, well-graded, well-kept highway. In the year 1921 alone the Bureau of Public Roads will be responsible for the expenditure of $100,000,000 of the Government's money, and more than an equal amount appropriated by the States.

It is an interesting commentary upon the growth of the "good roads" movement that the Office of Public Road Inquiry, which was the name by which the Bureau of Public

Roads was first known, was created in 1893 with an annual appropriation of $10,000—nearly enough to build a quarter of a mile of modern highway. But it established itself in the front of the fight for better roads, the work grew, and its supporters have multiplied a thousandfold. For more than a score of years its rôle was that of the searcher after knowledge. The testing and research work which it carried on during this period laid the foundation of the structure of modern highway engineering, and much of the testing apparatus which is now used the world over to measure the value of road materials was developed during this fruitful period.

Sand and Clay.

Offhand, sand-clay doesn't sound very promising when you ask about the road ahead. But if you know what the Bureau of Public Roads has done with these materials you will take heart. Until the possibilities of this type of construction became known the public roads of a large section of the Southern States had never been improved. Its discovery and development marked the first impulse toward rural development in that region; and from 1900 to 1912 hundreds of thousands of square yards were built under the direct supervision of Public Roads engineers sent out to assist local county and district road authorities.

Every other type of road construction adaptable to rural conditions was carefully studied and the simplest and best methods of constructing them were taught to the local road builders of counties all over the United States.

The Automobile Brings New Troubles.

When the automobile came to demand a further improvement in the character of the roads which were being built, the testing division of the Bureau of Public Roads did more than any other single agency to develop the intelligent use of asphalts and tars with which to settle the clouds of dust raised by the new vehicle. The bituminous materials which solved this problem had never before been used in road construction. In chemical composition they are extremely complex and variable, and no one knew what composition was needed for any particular highway use. The adjustment of these materials to their new use and the standardization of manufacturing processes was a work which is comparable to the development of such basic structural materials as steel and cement.

The development of these materials definitely solved the problems of the dust nuisance and of surface wear. Though the traffic which uses our roads has increased from five to ten fold in the last decade, the highway builder still finds no difficulty in building roads which are practically dustless and which are scarcely perceptibly worn down by the passage of the hundreds of thousands of vehicles which use them each year.

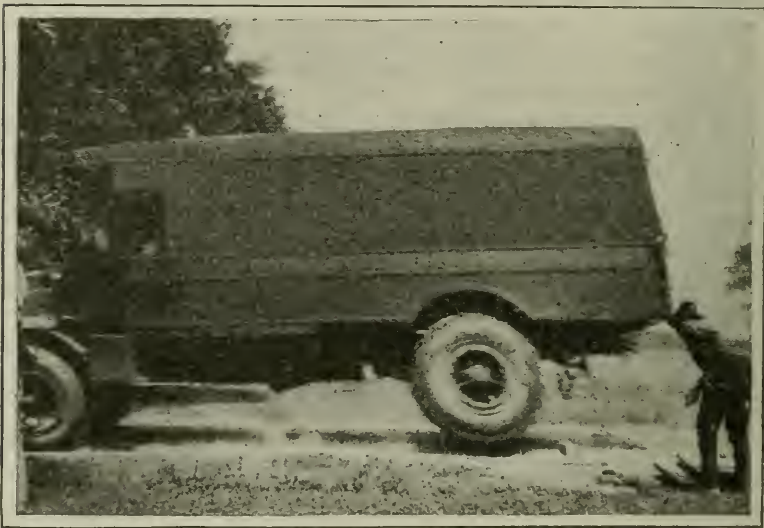
But the engineers have not been permitted to rest content with these achievements. A type of vehicle has come into use almost in a day which is so different from any other vehicle that has ever traveled the highways as to require the most fundamental alterations in standards of road construction. This vehicle—the motor truck—carries twice as much freight at a single load as ever has been hauled by road before. Formerly the heavier loads were drawn by plodding horses at the pace of 3 miles an hour, but these marvelous vehicles can go five times as fast. Their great weight and speed have taught us that roads which formerly were thought to be smooth are full of small depressions and inequalities of surface. The trucks, as they rumble over the small elevations and fall into the adjoining depressions, deliver great hammer-like blows, the effect of which upon the roads is greater far than the weight of the vehicle and its load. Anyone who has stood near by as one of the huge Army trucks was passing, and has felt the road quiver under the punishment of its solid rubber tires, can appreciate the tremendous destructive force which they exert.

They do not greatly wear the surface of the roads, but they do a damage which is far worse. Roads which were built for the traffic of five short years ago are literally shattered to pieces by the herculean blows of their wheels. The deterioration is not, as formerly, a product of many vehicles and long periods, but may result from the passage of a single heavy vehicle, in the same way that a bridge will collapse under a load which is too heavy for it. To prevent this damage is the new highway problem.

Defense Against Motor-Truck Impact.

The blows a motor truck delivers to a road, like the shells a big gun hurls into a fortress, can be withstood only if the force of the impact is accurately known in advance and adequately provided for. The first move in solving the problem of road building for motor-truck traffic was to find out how much force the truck puts into a blow.

Researches conducted at the Arlington Experimental Farm near Washington have given highway engineers the



Measuring Motor Truck Impact at the Arlington Experimental Farm.

basis for the design of highway surfaces which will withstand the impact of motor trucks, by measuring the intensity of the blows delivered. It has been found, for example, that a 5-ton truck equipped with solid rubber tires and traveling at a speed of 15 miles per hour, striking a surface depression only one-quarter inch in depth, delivers a blow to the road equivalent to four times its actual weight. Carrying the research a step farther, it has been found that the intensity of the blow delivered is enormously reduced by the use of pneumatic instead of solid rubber tires.

Having measured the intensity of the blows of the truck wheels, and having developed entirely new apparatus by which such measurements can be made by others, the Bureau of Public Roads is now proceeding to examine, in detail, the effects of the trucks upon different types of roads, expecting in this way to be able to propose definite new standards of construction to replace those which have been outgrown. How important these researches are may be judged from the fact that the president of the American Association of State Highway Officials, a body composed of the leading highway engineers of the country, referred to them recently as the outstanding accomplishment of the year. The cost to the people of the United States was about one-hundredth of 1 per cent of the amount of money that was spent for road construction in the country during the year.

A Tremendous Job.

To know what kind of roads ought to be built is very important. But actually to build them throughout a country like the United States is another thing. A long step toward the first goal has been made at small expense by a small force of earnest men. To do the second requires an army of men and a pile of money. The Federal aid and national forest road work constitutes the greatest program of road construction ever undertaken under single control in the history of the world. The appropriations now available provide for the construction of roads which will cost nearly twice as much as the Panama Canal.

The law under which this great work has been conducted since July 11, 1916, is known as the Federal-aid road act. As the name of the act implies, the roads constructed under it are not built by the Federal Government alone, but by the States and the Government in cooperation. The framers of the law recognized the success which had crowned the efforts of the States with highway departments to supervise the construction of their roads, and one of the principal provisions of the law was designed to encourage the formation of adequate highway departments in all the States. The duty of actual supervision of the construction of the Federal-aid roads is laid upon the highway departments of the States, and no State can receive aid under the law unless it has such a department adequate in the opinion of the Secretary of Agriculture to perform the functions expected of it.

Far-Reaching Results.

To this requirement of the law are due some of its most far-reaching results. In order to comply with it, 17 States, which previously had either no State department at all or departments insufficiently equipped to perform necessary functions, have been led to establish adequate departments of the State government to care for the important work of highway construction. In one year after the passage of the act more constructive highway legislation was placed on the State statute books than had ever before been enacted in a similar period in the history of the country; and a condition was brought about which otherwise would not have been reached in less than 5 or 10 years.

The insistence of the Government upon the construction of Federal-aid roads under the supervision of the State departments has resulted in placing a much larger part of the road work of the country under skilled engineering supervision. Thus, in 1915, the year before the act was passed, only 30 per cent of the money spent for roads and bridges in the United States was expended under the supervision of State highway departments. In 1921 the State departments will exercise control over fully 80 per cent. In this respect the act has exerted a powerful influence for economy and efficiency in the administration of the road work of the country.

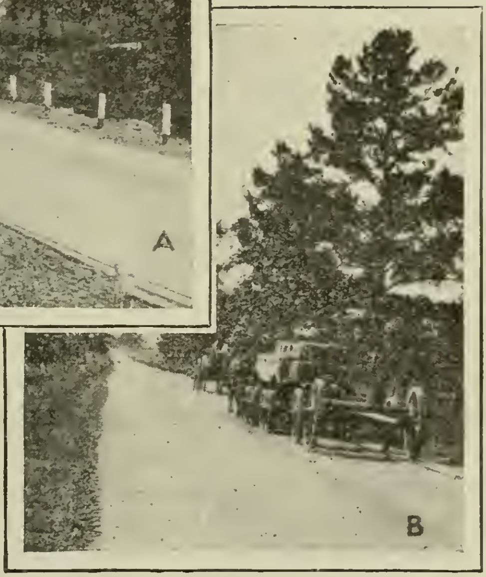
The funds appropriated by the act may be used only for the construction of roads, the duty of maintaining them after they are constructed being laid upon the States. As a means of enforcing proper maintenance the law gives the Government authority to withhold future allotments of Federal aid in case any road constructed is not maintained in a manner satisfactory to the Secretary of Agriculture.

The amount of aid which may be granted to any one piece of construction is limited to 50 per cent of the cost of the labor and material employed, and to $20,000 per mile, exclusive of bridges of more than 20 feet clear span.

The Money.

The original act with its amendment appropriates a total of $275,000,000 for Federal-aid roads and $19,000,000 for

A. A concrete road near Easton, Pa.



B. This road in Texas is not as expensive as the Pennsylvania road, but it will serve its purpose just as well.

Federal-Aid Roads Are Built to Carry the Traffic.

the construction of roads and trails in the national forests. The amount appropriated for aided roads by the original act was $75,000,000, and this amount was made available in five annual installments beginning in July, 1916, with $5,000,000 and increasing by $5,000,000 annually to July, 1920. This method of appropriating the money was adopted to give the States an opportunity to expand their organizations and handle the greatly increased funds.

Only the allotments for the first two years were appropriated according to this original schedule, however, because in February, 1919, the Congress appropriated $200,000,000 additional, which it made available concurrently with the first appropriation, $50,000,000 for the fiscal year 1919, and $75,000,000 for each of the two years 1920 and 1921. This made the total appropriations for these years, $65,000,000 for 1919, $95,000,000 for 1920, and $100,000,000 for 1921.

The method of appropriating the money by years is clearly shown in the following table, which also shows how the $19,000,000 for forest roads was appropriated.

Method of appropriating Federal-aid and forest-road funds by fiscal years, beginning July 1, 1916.

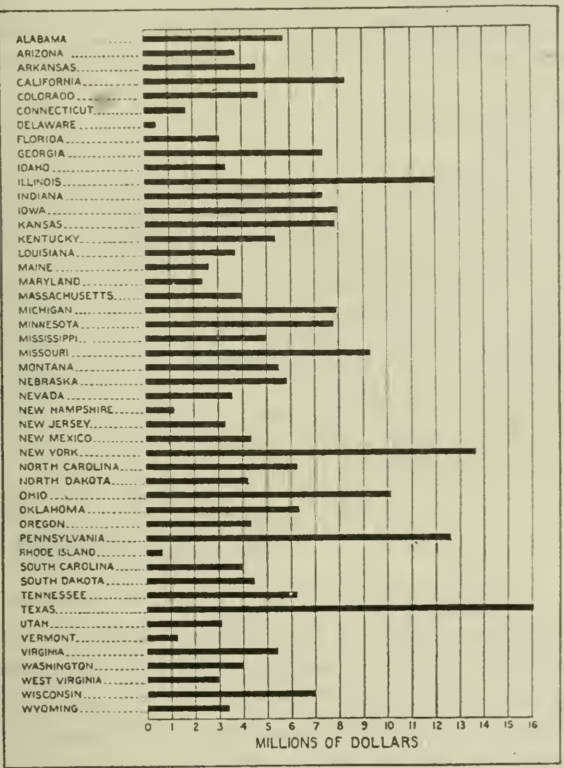
Fiscal year.	Federal-aid funds.			Forest-road funds.		
	1916 appropriation.	1919 appropriation.	Total.	1916 appropriation.	1919 appropriation.	Total.
1917	$5,000,000		$5,000,000	$1,000,000		$1,000,000
1918	10,000,000		10,000,000	1,000,000		1,000,000
1919	15,000,000	$50,000,000	65,000,000	1,000,000	$3,000,000	4,000,000
1920	20,000,000	75,000,000	95,000,000	1,000,000	3,000,000	4,000,000
1921	25,000,000	75,000,000	100,000,000	1,000,000	3,000,000	4,000,000
1922				1,000,000		1,000,000
1923				1,000,000		1,000,000
1924				1,000,000		1,000,000
1925				1,000,000		1,000,000
1926				1,000,000		1,000,000
Total	75,000,000	200,000,000	275,000,000	10,000,000	9,000,000	19,000,000

Three per cent of these annual amounts may be deducted by the Secretary of Agriculture to pay for the administration by the Federal Government, after which the balance is divided among the States. The division or apportionment is made in accordance with a rule laid down by the act itself—a rule so ingeniously devised as to make sure that there can be no unfairness in the distribution of the money. According to this rule each State gets a part of each annual allotment which bears to the total allotment the same ratio as the area, population, and mileage of rural delivery and star postal routes in the State bears to the total of these factors for the United States as a whole. The diagram on the next page shows the total amount allotted to each State for the whole 5-year period covered by the acts.

How It Is Done.

The administration of those vast sums, of course, calls for a large organization. That the organization can never be overdeveloped, however, is assured by the 3 per cent limitation on administrative funds. As the Federal funds must be met by at least an equal appropriation of State money, the allowance is really only 1½ per cent of the whole fund administered.

Instead of centralizing all authority in Washington, the United States has been divided into 13 districts, with a dis-

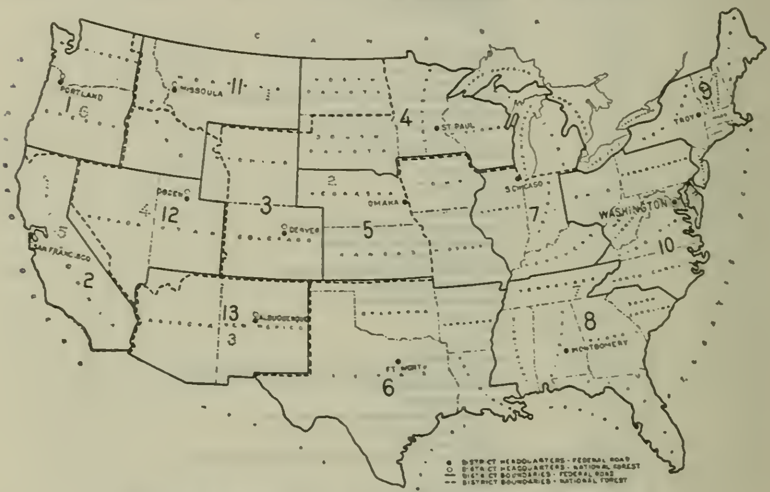


Federal Aid Apportioned to the States to July 1, 1920, Inclusive.

trict engineer in charge of each, who is authorized to deal directly with the State departments in his district. Where the work is sufficiently heavy to warrant it, one or more resident engineers have been placed in a State. By thus decentralizing the organization, much closer relations can be maintained with the State departments than it would be possible to bring about through a single remote organization located in Washington. And as the district engineers are authorized to approve plans submitted by the States, a great deal of time is saved which would otherwise be lost in sending plans and documents back and forth to Washington.

The central organization at Washington is comparatively small, consisting only of the chief of bureau and chief engineer and a staff of reviewing engineers maintained to coordinate the work of the various districts and to act as a check upon the district offices.

According to recent reports, over half of the projects handled are passed by the district offices in an average of five



Federal-Aid Districts and District Headquarters.

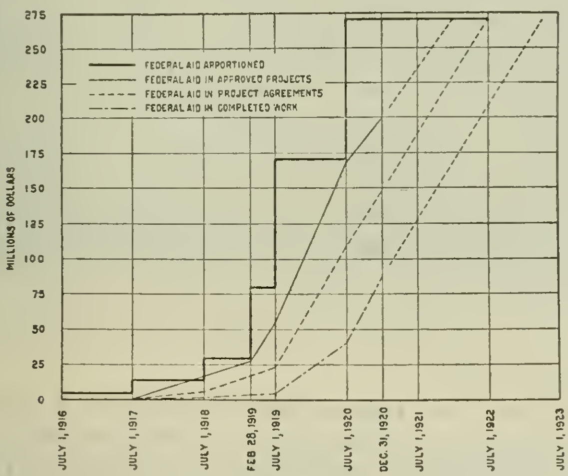
days. Greater delay at this stage is generally due to the necessity for careful investigation to determine whether the road proposed is of sufficient importance to warrant the expenditure of Federal money upon it. When these doubtful points are cleared up the prompt passage of the project to approval by the Secretary of Agriculture is practically assured, as 90 per cent of all projects received at Washington are passed by the Bureau of Public Roads in an average of four days.

The Progress of the Work.

Up to December 31, 1920, 3,630 projects involving a total of 35,045 miles of road had been approved by the Secretary of Agriculture. The preliminary estimate of cost upon these projects was $473,852,216.96, of which $198,966,230.37 will be approved as Federal aid. On the same date 817 projects representing 4,302 miles had been entirely completed, and 2,034 additional projects were in various stages of construction. The projects that were under construction include 17,219 miles, and they were reported as being 45 per cent completed on December 31.

Including the aid allotted to the projects entirely completed and that allotted to the completed portions of projects under construction, the work which had been done up to the end of the calendar year involved $83,000,000 of Federal aid, and the total cost of this completed work has been estimated at $193,000,000.

The accompanying diagram shows graphically the principal steps in the expenditure of the Federal appropriations.



Federal-Aid Progress.

The heavy stepped line indicates the annual allotments to the States, increasing in amount from $4,850,000 ($5,000,000 less 3 per cent) the first year to $97,000,000 for the fiscal year 1921, the total amount allotted during the five years being $266,750,000.

The solid line next to the right shows the amount of Federal aid allotted to projects approved by the Secretary of Agriculture. The dotted extension beyond December 31, 1920, indicates that by December 31, 1922, the Secretary of Agriculture will probably have approved enough projects to absorb the whole Federal appropriation now available.

The dashed line shows the amount of Federal aid involved in the projects for which formal cooperative agreements had been entered into at any time.

The last line—the dotted line—indicates the amount of Federal money involved in the work completed at any given stage.

Character of Federal-Aid Roads.

No effort has been made to encourage the construction of any particular type of road. Though there have been those who have urged that no roads should be constructed except of the highest and most expensive types, the legal requirement that the roads shall be "substantial in character" has not been thus interpreted.

It has been recognized that the heavy and expensive construction which is necessary in New York, Massachusetts, and Pennsylvania is not suitable or necessary for the less exacting traffic of Nevada, Idaho, and the Dakotas. A number of other considerations have influenced the choice of type in many cases. It is frequently found that suitable local materials are so much less costly than better materials imported from a distance that the construction of a lower class of work with the local material is justifiable; and as it is important to develop material sources throughout the country on as large a scale as possible, approval of the use of local materials is not infrequently given for the purpose of encouraging local production. There are also peculiar conditions affecting the methods of construction. For example, in parts of the far west the entire absence of water along a right-of-way and the expense of piping an adequate supply for 20 or 30 miles often make it necessary to approve a type of construction which can be built without the use of large quantities of water.

With these and other similar conditions in mind, the initial decision as to the type of a particular road is made by the State highway department. Its decision is reviewed by the Bureau of Public Roads after an independent study of the conditions, and the type of road finally decided upon is that type which in the judgment of the engineers of the State department and of the Bureau of Public Roads is the most suitable under the circumstances.

The types of road selected and constructed in this manner have included practically all the well-known forms of construction from earth to concrete, brick, and bituminous concrete. The lower types—earth, sand-clay, and gravel—predominate in mileage, including about 66 per cent of all the road constructed. The intermediate types—water-bound and bituminous macadam, etc.—constitute about 7 per cent of the mileage, and the higher types involve about 24 per cent.

In point of cost the order is reversed. The higher types, including cement concrete, brick, and bituminous concrete, which account for only 24 per cent of the mileage, have called for 60 per cent of the money. The earth, sand-clay, and gravel roads, which make up 66 per cent of the mileage, have used only about one-quarter of the money.

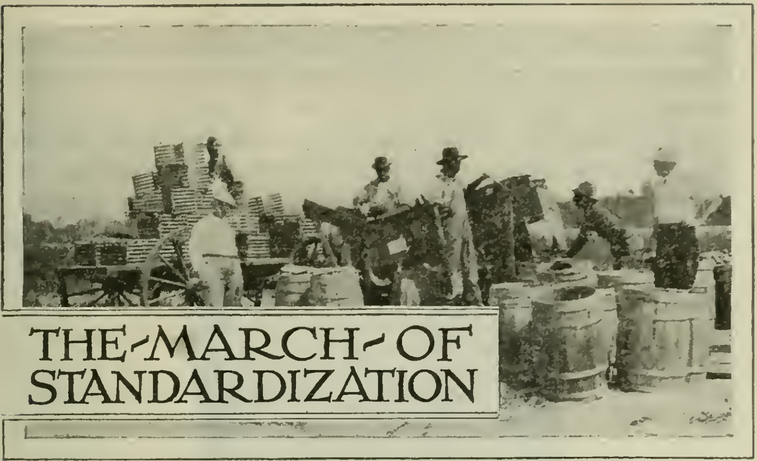
In Wisconsin the Federal Money is Going Into Such Works As This Road and Bridge.

Forest Roads.

In addition to the administration of the Federal-aid work, the Bureau of Public Roads is also responsible for the construction of roads and trails in the national forests, for which $19,000,000 have been appropriated by Congress.

In this work the Bureau of Public Roads cooperates with the Forest Service. Within the national forests are approximately 15,000 miles of roads which form connecting links for State and county highway systems. As the States have no jurisdiction over these roads Uncle Sam must see that they are kept in good condition.

The improvement of these roads and the construction of a supplementary system of roads and trails for purposes of fire protection constitute the national forest road project. The importance of the work is enhanced because of the fact that the forest areas all lie along the mountain summits and, therefore, contain the passes through which the important trunk highways must cross the mountain ranges. The transportation of forest products, the protection and administration of the forests themselves, and the utilization of these national areas for recreational purposes are all dependent upon these roads.

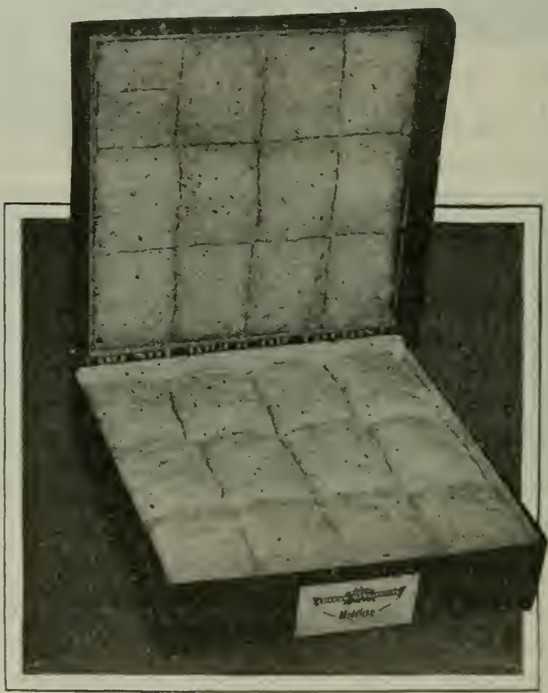


THE MARCH OF STANDARDIZATION

By Harold W. Samson,
Specialist in Standardization, Bureau of Markets.

THE reform wave struck the produce business along with the refrigerator car. That was about 40 years ago. Then it was that the thrifty grower turned his attention to educating the appetite of the Nation to demand strawberries in January and lettuce the year round, and the great distributing centers began to draw their supplies from the four corners of the country. The personal contact which to a large extent had existed between buyer and seller was broken, and distribution problems became intricate. The inevitable result was an attempt to smooth out the many difficulties incident to doing business at long range by improved methods of grading and by the development of a common language. Stern necessity is a great teacher, and the records show that the instances are few and far between where "the mother of invention" has not been the counselor and friend who has pressed the adoption of definite standards upon the unwilling industry. But she has been faithful to the trust; and although much remains to be done, those who have watched the march are viewing the present situation with a feeling of satisfaction and are looking to the future with a lively hope. The producers and dealers are awake, and it is only a question of time before there will be a general adoption of uniform grades. Every branch of industry has sooner or later recognized the fact that progress must come through the proper application of the basic principle of standardization.

The history of cotton standardization dates back to 1793, when Eli Whitney invented the cotton gin, and the rapid increase in production stimulated the demand for standards of quality. There has been a gradual extension of trading



U. S. Middling Cotton.

The Department of Agriculture has standardized nine grades of cotton. Middling is the basic grade on which future contracts are based. The higher and lower grades are sold on the basis of so many points on or off middling.

on the basis of grade since that time, but not until six years ago were the official cotton standards of the United States promulgated under the provisions of the United States cotton futures act. The use of these standards is now compulsory in the settlement of future contracts on the exchanges in the case of delivery of cotton thereunder, and they are also used as a basis for quotation in all the spot markets of the country.

The grain trade went along for years with no official grades. It is true that most of the leading grain-producing States had grades, and where such State standards were not in effect boards of trade and chambers of commerce adopted their own grades and controlled the grading of incoming and outgoing shipments. But too many standards are little better than none at all, and the greatest confusion and dissatisfaction reigned. The demand for uniform standards was practically universal, coming not only from farmers, grain societies, exchanges, and manufacturers in our own country, but from buyers from foreign countries, where American grain was falling into disrepute solely on account of our unsatisfactory grading practices. In 1916 public sentiment on this subject had crystallized sufficiently to induce Congress to pass the United States grain standards act, one of the principal objects of which was the preparation of a single set of standards for American grain. Federal grades for wheat, oats, and shelled corn have been established already, and similar grades will soon be ready for rye, barley, grain sorghums, milled rice, and flax. The common language is to this extent an accomplished fact.

These examples could easily be multiplied, but it is the same story in reviewing the history of marketing agricultural products, no matter what the commodity may be—live stock or eggs, wool or hay. Eventually there will be uniform standards, and that means national standards, for State boundaries have long since been obliterated in our national scheme of distribution.

Potatoes Get in Line.

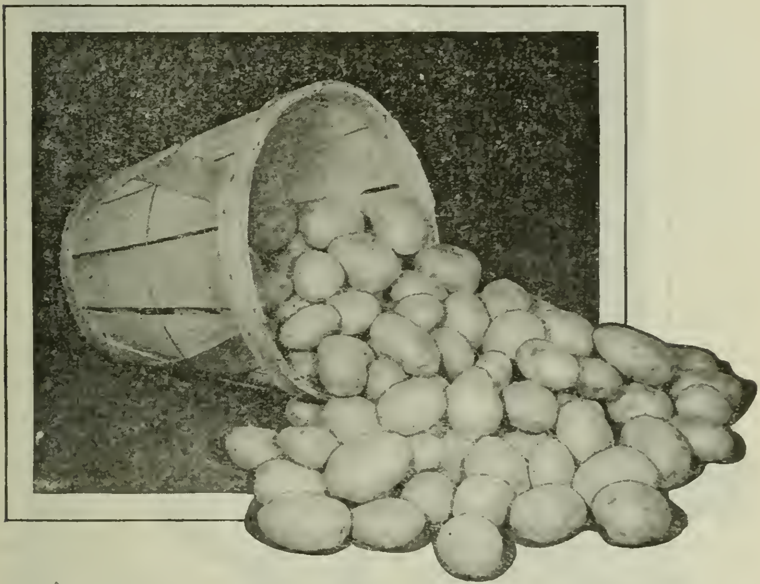
It was in 1915 that the Bureau of Markets first inaugurated an experimental telegraphic market news service on fruits and vegetables, and in so doing brought the fact home to the shipper that it is very difficult to report current prices unless they are based on definite standards of pack and quality. Potatoes may be \$2 a bushel in Chicago, \$3 in New York, and \$2.50 in Cleveland, but unless the grade of these potatoes is known there is no means of determining which market is giving the shipper the best returns.

A force of investigators was therefore assigned to the task of formulating suitable grades for perishables; and on account of their great importance as a staple food, potatoes were selected as one of the crops to receive first consideration. By the time the United States entered the World War these investigations had established the practicability of marketing potatoes by grade, and had placed the department in a position to make definite recommendations as to what the grades should be.

It is fortunate that this was true; for the summer of 1917 presented the prospect of a record-breaking crop, and with the transportation facilities of the country seriously overtaxed it became a problem as to how this supply was to be stored and moved into the markets in quantities which could be absorbed. A glut would have cost producers enormous losses and discouraged production at a most critical period. In order to relieve the financial needs the Federal Reserve Board authorized its member banks to make loans against warehouse receipts for potatoes when properly graded, packed, stored, and insured. The board set forth in a letter to the United States Food Administration that under these conditions potatoes constituted a readily marketable, nonperishable staple within the meaning of the regulation relating to commodity paper. Immediately following this ruling the Department of Agriculture and the Food Administration jointly recommended the U. S. grades, the use of which, on January 31, 1918, became compulsory as far as the licensees of the latter organization were concerned. This ruling continued in effect until after the signing of the armistice.

About this time also a food products inspection service was organized by the Bureau of Markets, with offices in the larger markets of the country. Its inspectors were disinterested parties who could paint a word picture which would enable the arbitrators of the United States Food Administration to make proper adjustments. Their certificates also furnished a basis for settlements between shippers and receivers in cases of disputes over quality or condition.

Here again the U. S. potato grades stepped into prominence and enabled the inspectors to determine accurately what shipments complied with the prescribed standards and what did not. The result was gratifying to reputable shippers and dealers alike. One prominent broker said: "It is much easier to do business on a definite basis, and dealers do not hesitate to make purchases and to give bank guaranties, since they realize that in case the shipper does not live up to his contract the purchaser can secure fair dealing through the Bureau of Markets inspection service." Of course, it worked both ways, as will appear in the following letter from a shipper: "Am pleased with your report on car of potatoes I C 59782. This car left here in fine condition, being one of the best cars I ever loaded. There was no excuse whatever for Smith to kick about accepting this car." The development of standard grades has made such service possible.

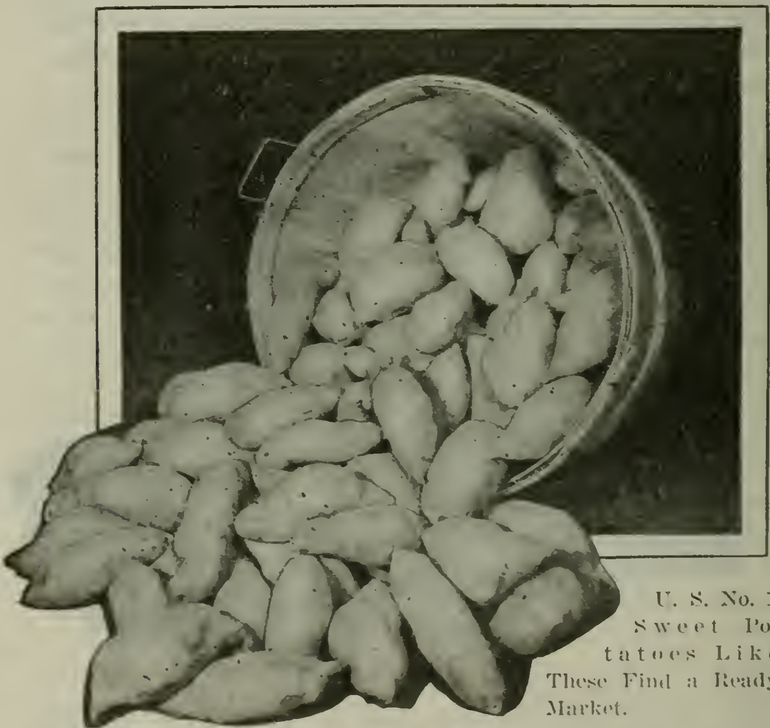


Hamper of Well-Graded U. S. No. 1 Potatoes.
The U. S. potato grades are now generally recognized throughout the country.

Thus it was that the U. S. potato grades became so well established during the war that thereafter they were used by the trade voluntarily. To-day these grades are the official standard in nine States which represent 25 per cent of the total production of the country, and in addition to this territory they are used voluntarily in practically every other important producing section. When one considers the chaotic condition which prevailed prior to 1916 there is certainly room for encouragement in reviewing the work of the past four years.

Onions and Others.

It was again the development of a telegraphic market news service at Laredo, Tex., in the spring of 1916 that turned the attention of the Department of Agriculture to the grading of Bermuda onions. Growers and members of the trade had already given the subject much attention, but had not secured uniformity. Two seasons were spent in studying the grading and packing methods, the market de-



U. S. No. 1 Sweet Potatoes Like These Find a Ready Market.

mands and preferences, and in the comparison of the prices and movement of graded and ungraded stock. It takes a lot of time and figuring to find out where the "Doubles," "Bottle Necks," "Seed Stems," and "Pinks" belong and then to write out in plain language just what the shippers should put in the package. When the work was finished the recommendations of the department were promulgated as the official standard for inspection by the Texas State Legislature, and by this act two-thirds of the Bermuda-onion crop of the country was required to be packed on this basis.

The remainder of the crop is grown in California and Louisiana, and the former State has already signified its intention of adopting the same standard for the coming year.

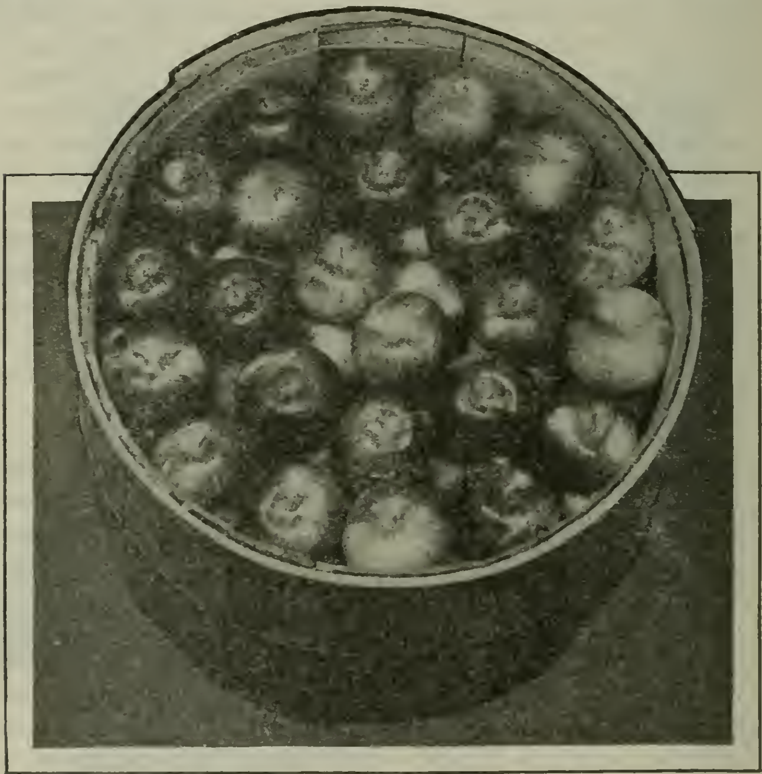
A recitation of the particular circumstances which led to the development of grades for other crops would be in many respects a repetition of the progress of potato and Bermuda-onion standardization. Onion growers in the North and sweet-potato growers in the South have also felt the need of similar standards for their products; and the Department of Agriculture, with their cooperation, has prepared and recommended grades. The general success which has attended their use has enlisted the interest of growers of other products, and those who are in the best position to know realize that this work will never cease until the entire list of farm products is included. Much has already been done in a preliminary way on cabbage, celery, lettuce, asparagus, and tomatoes; and tentative standards are now being discussed with the trade. Thus the same sound business principle is being applied to crops which heretofore have been considered as more or less impossible subjects for standardization.

The development of grades for fruit has progressed along somewhat different lines. For many years shippers located on the Pacific coast have graded their fruits and vegetables, and at present there are no products more carefully graded as to quality and size than northwestern apples and California citrus fruits. This development was literally forced on these sections, for it was impossible for them to pay the high freight rates to distant markets and compete with products grown at near-by points without carefully selecting their stock for appearance and carrying qualities. The rigid inspection provided by the shipping organizations, many of which are run on a cooperative basis, has also been a great factor in securing uniformity. The results which have been obtained have been so striking that the growers in most of these States have written these grades into the State laws in order to protect the good name of their industry.

Apples in the Barrel.

In the case of barreled apples the changing of the trade practices of many years' standing has been a slow process. What has been accomplished is the result of the untiring zeal of public-spirited men, leaders in their industry, who have pressed the adoption of grading laws, and of the influence of trade organizations and horticultural societies.

The first definite move to remedy the situation by legislation was the introduction in Congress of the present apple-grading law, commonly known as the Sulzer law. The passage of this act served to awaken public sentiment in favor



A Good Commercial Pack of U. S. No. 1 Rome Beauties.

The use of modern packing house equipment is bringing about a great improvement in the grades.

of providing a standard which would eliminate fraudulent and deceptive packing, stabilize the market, and stimulate better methods of production; but its provisions were wholly permissive, and there was no apropriation for its enforcement.

So much difficulty was experienced in harmonizing the conflicting opinions of the various producing sections that the Department, working in close cooperation with progressive men in all branches of the industry, prepared a proposed law which was introduced in the legislatures of the apple-producing States. So many unnecessary modifications were made to fit local conditions that the result has been anything but satisfactory. To-day there are some 15 State apple-grading laws differing in many important details and in some instances inconsistent with good commercial practice. Not only that, but there is no uniformity of interpretation nor of enforcement. When a buyer finds 10 different kinds of graded apples on his market he is inclined to lose heart and resort to his former practice of opening the barrel and taking a look before parting with his money.

Standardization legislation is now being attempted along sounder lines. Some recent State marketing laws provide departments with authority to establish and enforce official grades. These grades may be modified at any time without resort to the legislative bodies for amendatory action. Even if the regulations of the various States should conflict, there is always opportunity for the marketing officials to smooth out their differences in conference or for all to accept the recommendations of the Federal Government.

The Department of Agriculture has studied barreled-apple grading since 1916 and now is ready to recommend a standard which can be used by all producing sections.

Making it Easy to Get a Square Deal.

Standardization of the containers for fruits and vegetables is intimately connected with standardization of the products themselves. In the interest of a square deal, the capacity of shipping packages should be definitely fixed in sizes readily distinguishable from each other. In the old days the only way to determine the capacity of an apple barrel was to measure it, for each grower used his own judgment about size, and if he had no apple barrels he used flour or sugar barrels instead. This placed a premium on dishonesty, and the " short measure " dealer thrived. In 1915 the standard barrel law was passed by Congress, and in one year the motley array of deceptive and nonstandard fruit and vegetable barrels was replaced with a single series which met all the needs of the trade. Then the Department turned its attention to the question of grape baskets, berry boxes, and small till baskets. The situation was even worse than in the case of barrels, for the sizes were based on standards of both weight and measure. About all a customer could say when he bought a quart of berries was that he had a quart more or less. The standard container act took care of that, and now there are three standard sizes of grape baskets, 2, 4, and 12 quarts: and berry boxes and till baskets are made in definite subdivisions and multiples of the dry-measure quart.

So far, so good. But there are in common use to-day about 40 styles of cabbage crates, 30 styles of lettuce crates or boxes, 20 styles of celery crates, 50 styles and sizes of hampers, 15 styles and sizes of round stave baskets, and market baskets varying in size from 1 quart to 24 quarts. A relatively few sizes would satisfy the demands of the trade. After several years' study the bureau has recommended standards for the last three types of packages in this list, and these standards are contained in legislation pending in Congress. The short-measure package is doomed.

The year 1920 finds the agricultural districts harvesting bountiful crops, but never in the history of the produce business have the marketing problems been so numerous or so difficult. The national trade organizations are analyzing their trade customs more carefully than ever before and the leading thinkers are pointing the way to opportunities for increased efficiency. Associations of shippers, brokers, and jobbers are putting down in black and white their ideas of business ethics for the guidance of their members; trade terms likely to be variously interpreted are being defined, and arbitration committees are planning bureaus for the settlement of disputes. These are healthy activities and they all lead straight to the development of uniform grades.

Unjustifiable rejection of shipments on account of a declining market is the shipper's nightmare, just as enforced acceptance of poorly graded products is the bugbear of the receiver. The answer to the whole problem is definite, practical grades. When shippers furnish products of standard quality and receivers are willing to enter into contracts on that basis, the business of marketing farm products will have reached the goal toward which it is marching.

GETTING OUR POTASH

By William H. Ross, *Scientist, Bureau of Soils.*

THE growth of all crops depends on the soil and the weather. The weather we always have with us; sometimes it is good, sometimes it is bad, and sometimes it is only fair; but in whatever state we find it we must learn to be content, for we can not change it. It is different with the soil. By faulty cultivation it is possible to make a good soil bad and, conversely, by proper treatment, to make a poor soil fertile.

A soil may be unproductive for many reasons, but the most frequent cause is an inadequate supply of the elements essential for plant growth, one of the most important of which is potassium. This element, probably better known under the trade name of potash, plays a very important rôle in the life processes of the plant. When it is lacking the leaves of the plant are brown and unhealthy and the stems become weak and brittle.

There is no substitute for potash as a food for plants. An adequate supply of it in an available form is absolutely necessary for the production of crops of desirable yield and quality. It enables plants to withstand more effectively the attacks of fungous diseases: it produces fleshy fruits of fine flavor and texture: and it supplies a food element absolutely essential to normal growth.

A suitable system of cultivation will serve in some soils to maintain a supply of potash for the crops: but where the natural supply in the soil is insufficient it is necessary to apply potash from outside sources. Even where there is an abundance of insoluble potash materials in the soil, it has been found profitable in many cases to apply soluble potash salts.

Sources of Potash.

The principal ultimate source of all potash salts is a class of igneous rocks known as the feldspar group. By exposure to water and atmospheric agencies these rocks are decomposed and the potash is leached out and is deposited in the soil or carried by streams to the ocean or to inland depressions. When the water into which the potash has been carried evaporates, soluble deposits are formed. The potash liberated from disintegrated rocks is also taken up and stored in plants and may be recovered again when the plant is burned or otherwise treated. There are thus three distinct sources from which potash is obtained: Rocks, salty lakes or soluble deposits, and plant materials.

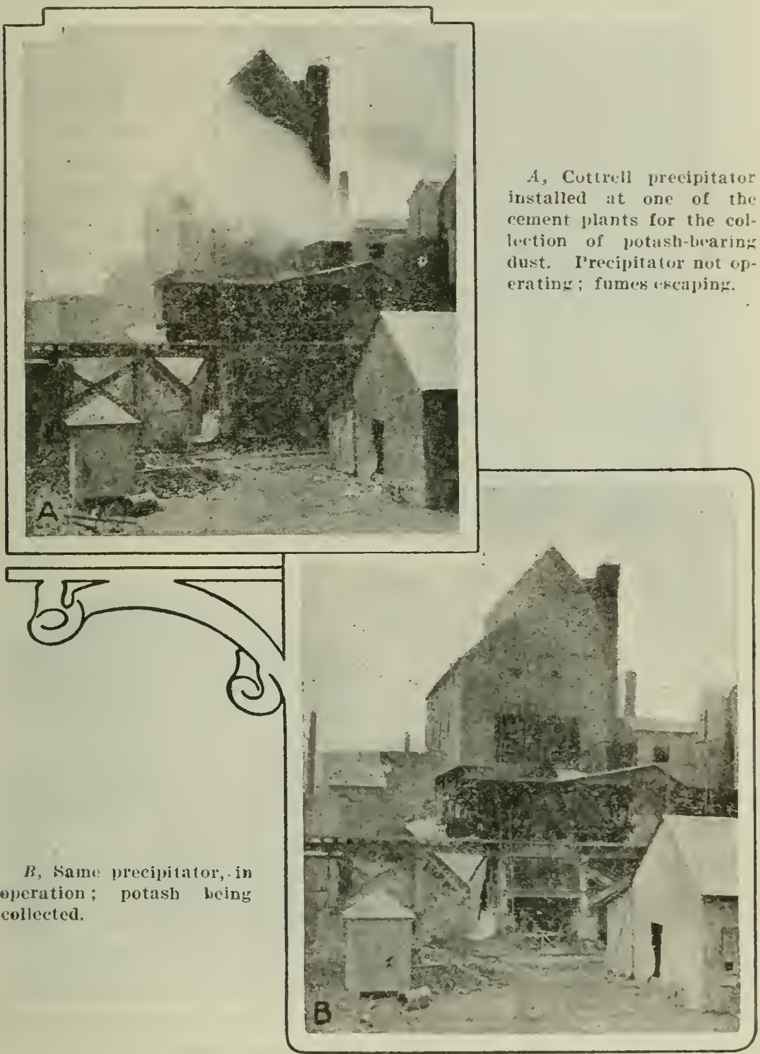
Plentiful, but——

Potash is one of the most widespread and abundant constituents of the earth's surface. The tremendous amount in the United States in various forms can be indicated best by a comparison with phosphate. Uncle Sam is said to have the greatest phosphate deposits in the world, but his potash holdings are twenty times as great. These holdings, however, are so widespread and of such low concentration that no deposits anywhere are known to average much over 10 per cent. Furthermore, though some of the combinations in which potash occurs are soluble, the great bulk are not soluble in water—or even in acids.

From the Rocks.

The principal rocks containing potash are feldspar, mica, greensand, leucite, and alunite. The last three are found only in certain localities; the first two are widespread. With the exception of alunite all contain silica as well as potash and are therefore often spoken of as potash silicates.

A great many attempts have been made, both in this country and abroad, to use these mineral rocks directly as fertilizers but without very marked success. Some soils respond to applications of these minerals, particularly greensand, but owing to their low solubility the results obtained as a rule were scarcely sufficient to justify the expense. It was soon

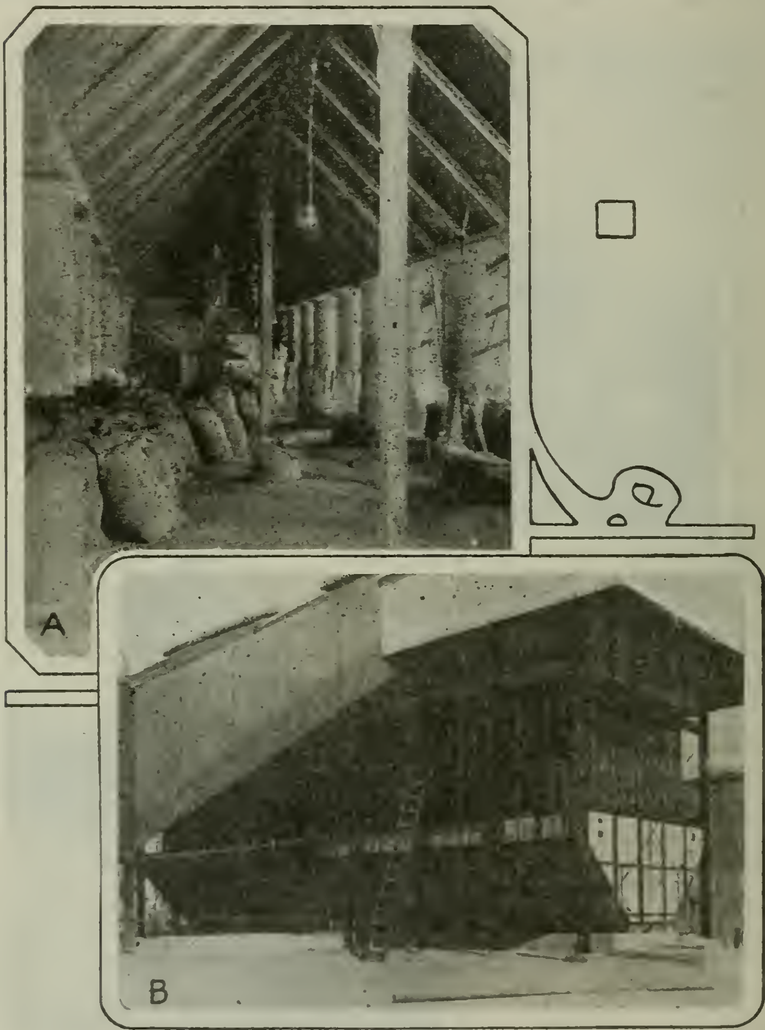


A, Cottrell precipitator installed at one of the cement plants for the collection of potash-bearing dust. Precipitator not operating; fumes escaping.

B, Same precipitator, in operation; potash being collected.

Potash from Rock.

recognized that much better results might be expected if the minerals were first treated in some way to render the potash soluble before applying it as a fertilizer. Many processes have been proposed for decomposing the potash silicates, but the amount of potash that has actually been produced from this source is still very small. The reason for this is entirely



Collecting and Bagging Cement Dust.

A, Dust dropping from precipitator into bags. *B*, Close-up view of precipitator, showing pipes in which the dust is deposited.

an economic one. Many of the processes that have been devised are comparatively simple, and several of them make it possible to bring about a quantitative separation of the potash. If the percentage of potash in feldspar, for example, approached that of phosphoric acid in phosphate rock, the potash problem would long since have been solved. It unfortunately happens, however, that the potash in all silicates is comparatively low, and no mine-run rock has been found anywhere that contains as high a percentage of potash as the deposits of Germany and France in which the potash is already soluble.

It would seem, therefore, that the extraction and recovery of potash from silicate rocks at a price that will compete with the foreign product does not offer much promise, unless the potash is recovered as a by-product in some industry in which these rocks are used as raw materials. It is in this way that most of the potash so far obtained from this source has been prepared.

A study that was made of this subject a few years ago by the Bureau of Soils indicated that the most promising methods for recovering potash from the silicate rocks consist in igniting the rock with lime, as in the manufacture of cement, or in digesting the rock with lime and water under pressure. In the first process the potash is volatilized and passes from the kilns in the process of burning, while in the second it passes into solution during the digestion. In both cases the residue is suited for the manufacture of cement or other building material. At the present time these two processes are both being developed on a commercial scale, and of the numerous methods that were tested out during the war these are the only ones, so far as is known, that are now being operated.

The process of digesting the potash silicates with lime and steam under pressure has been given special attention by the Bureau of Soils, and it has been found possible with pressure, such as can readily be maintained in the industries, to bring about a very high percentage extraction of potash. This process is now being developed on a large scale for the treatment of greensand with the object of producing bricks and other building material in addition to potash, and there is every reason to believe that this will prove a profitable though limited source of potash in proportion as a market is found for the other products.

From Cement Kilns and Blast Furnaces.

In the survey that was made of the cement industry by the Bureau of Soils it was found that the total potash that escapes from all the plants of the country amounts to about 87,000 tons annually. The maximum actually collected in any one year (1917) amounted to 1,621 tons, which was 5 per cent of the total produced in this country from all sources. In 1919 the production from cement plants dropped to 1,250 tons. The decrease was due to unforeseen difficulties which developed in some of the plants in collecting the potash and in preparing it in a marketable condition. The potash volatilized from some plants was too small in amount to be profitably recovered. In other plants, where the loss of potash was greater, such a quantity of dust was collected with the potash that there was relatively too little potash to justify leaching the material, or shipping it for direct use as a fertilizer. This might be remedied (1) by increasing the proportion of potash volatilized; (2) by increasing the efficiency of the process used for its recovery; (3) by reducing the dust that escapes with it; or (4) by bringing about a mechanical separation of the potash and the dust during the process of collection. Very discouraging results have frequently been obtained in attempts at improvement in these directions. Progress, however, has continued to be made, and recent developments give assurance that the difficulties in the way are not insurmountable, but simply require time and attention for their satisfactory solution.

Potash silicates are not intentionally used in the blast-furnace industry, but are associated in varying amounts with the ore, coke, and limestone used in the charge. In the process of smelting, the lime reacts with the silicates as in the burning of cement, the potash is volatilized and escapes from the furnaces, and the residue or slag is sometimes used in cement manufacture. Potash may, therefore, be recovered from blast furnaces, and the situation with regard to its recovery in this industry is very similar to that outlined for the cement industry. A survey of this industry corresponding to that which was made for cement plants is now being made by the Bureau of Soils. The results obtained in this work and in large-scale experiments now being made at two plants in this country go to show that the percentage of potash in the dust that escapes from some blast furnaces is higher than that contained in the richest cement dust. However, success here is not dependent alone on the quantity that might be collected. The gases that escape from a blast furnace are combustible and after being freed from dust are used as fuel. In the present wet system for purifying the gases the potash is lost. Large-scale experiments are now being made on the purification of the gases by a dry system in which the potash is recovered with the rest of the dust. If it is demonstrated that the dry process is superior to the wet, then potash will be recovered in all plants in which the new process is installed. It is thus possible that potash at a comparatively low cost may yet be recovered from these furnaces.

From the Salty Lakes.

The soluble salts of potash possess a very salty, disagreeable taste and readily dissolve in water. If a natural deposit is not salty to the taste it does not contain sufficient potash to make it a profitable source. The converse does not hold true, however, for there are other materials which are salty, and when a salty deposit is found a chemical analysis is necessary to determine its value.

Since soluble potash deposits are formed by the evaporation of water in which the potash was originally contained, large deposits of this kind are located only where a large volume of water has had an opportunity to concentrate. This occurs in fresh water lakes which have no outlet or where some unusual geological formation has inclosed a body of sea water so that it has ultimately evaporated and deposited the salts which it contained.

The world's largest known potash deposit, that which occurs in Germany and Alsace, is supposed to have been formed in the way last mentioned. According to the accepted view, a large arm of the sea at some period of former times was shut off from the rest of the ocean by a bar of such peculiar formation that the sea water flowed into the bay at high tide but could not flow out. As the water evaporated, more and more was added at each successive high tide until, when the isolation of the bay had become complete, a deposit

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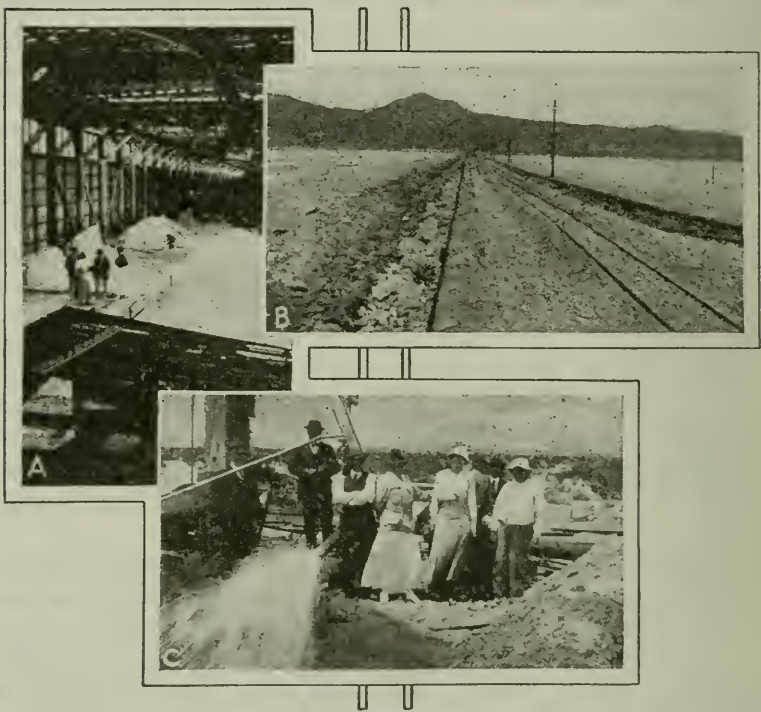
of potash and other salts was formed which extended over an area of many square miles and varied to a maximum of 5,000 feet in depth. In the course of time this was covered over with earth and vegetation, and not until 1857 was it recognized that the deposit contained a fertilizer material in the form of potash salts. The richness and extent of the



Potash from Salty Lakes.

A, Potash salts obtained from brine at Searles Lake, Calif. *B*, Pipe line through which brine is conveyed from the lake to the plant for evaporation and recovery of potash. *C*, Brine pouring into reservoir at plant.

deposit soon made it the principal source of the world's supply of potash, and this position it still maintains.

A number of relatively small potash deposits occur in this country, but unlike the European deposits all have been formed apparently by the evaporation of what was originally fresh lake water. The most important of these are in western Nebraska; at Searles Lake, Calif., and in the Salduro Marsh, Utah.

These deposits may all be said to represent a geological process that has not yet been completed, inasmuch as the lakes from which the deposits were formed have not yet been evaporated to dryness, but have simply been reduced in each case to a potash-bearing brine of varying concentration. In western Nebraska the brine is distributed in a number of pockets, the largest of which is known as Jesse Lake. When the brine of this lake is evaporated it yields a product containing about 25 per cent of potash. The recovery of the potash is therefore a very simple process and consists in pumping the brine from the lakes, concentrating in special evaporators to about 33 per cent solids, and finally drying in rotary kilns.

The production of potash from these lakes during the five years, 1915–1919, exceeded that from any other source in this country and amounted to 43 per cent of the total. The future of the industry will largely depend on the outcome of experimental work now under way. The product recovered at present consists of a mixture of several salts. By making a separation of the salts it would be possible to produce several materials of value instead of one, and a number of processes with this end in view are now being investigated. It is recognized, too, that the cost of concentrating the brine might be greatly reduced by applying solar evaporation, and as the concentration of the brine as it occurs in the lakes is greatest during the dry season, it is possible that the industry may yet develop into a seasonal one.

The deposit at Searles Lake is the largest known deposit of soluble salts in this country. It resembles those of Nebraska in that the potash is contained in a brine; but the association of salts is different. In the former the potash occurs as the chloride and in the latter as the carbonate and sulphate. The salts in the brine of Searles Lake are also characterized by the presence of a relatively high percentage of a soluble salt called borax. This has been shown to be injurious to crops when applied in fertilizers, and the recovery of the potash for fertilizer therefore involves not only evaporation of the brine but also purification of the potash by crystallization of the recovered salt. A satisfactory process seems to have been developed for this purpose, and the borax in the product that is now placed on the market amounts to less than 0.5 per cent—a proportion well below the danger point.

From Plant Materials.

The earliest potash materials to be used as fertilizers were plant ashes and kelp. These were frequently applied to the soil long before it was recognized that their fertilizing value was due to the potash which they contained. It is now known that all organic materials contain potash, and the quantity present in parts of many plants is much in excess of any other mineral constituent.

The potash in some organic materials is low, but in others the quantity present is sufficient to justify its recovery as a by-product when these materials are used in the industries. The most important of these sources of potash are sugar beets, wood, wool, kelp, and tobacco. With the exception of kelp, none of these products are primarily treated for the production of potash, and only the wastes resulting from their use in the industries are utilized in this way. The total amount of potash that is contained in these wastes is very large, but it unfortunately happens that these wastes are frequently too widely distributed to admit of the economic recovery of the potash. This is best illustrated in the case of the wood wastes. According to estimates that have been made by the Forest Service, the total potash in the ash of the wood burned as waste, together with that used as fuel, amounts to upward of 140,000 tons annually. About 80 per cent of the wood that goes into firewood is used on farms, and it is known that a portion of the ashes is applied as a fertilizer, but owing to the wide area over which wood is burned the greater part of the ash is not recoverable, and it is for this reason that the maximum annual production of potash from this source, under the stimulation of the high prices that prevailed during the war, amounted to only about 600 tons.

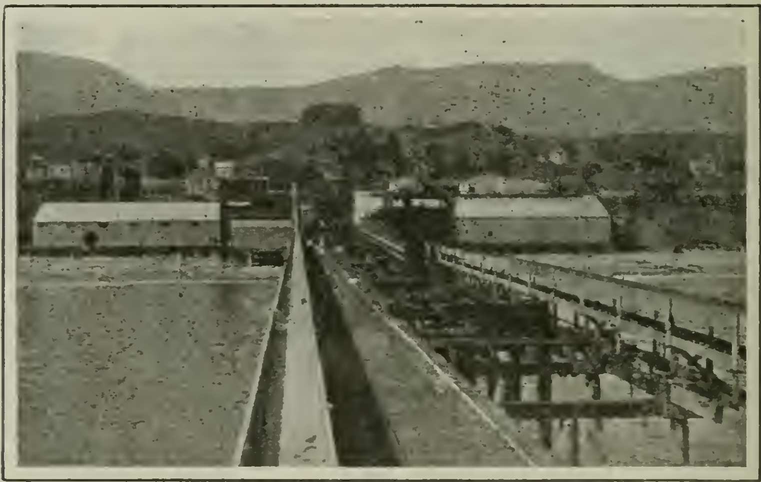
Other organic materials, such as kelp and sugar residues, are more localized in their distribution than wood ashes, and during the war these served as important sources of potash. The principal item of expense in the recovery of the potash from these materials has to do with the necessary evaporation of a relatively large volume of water. This is well illustrated in the preparation of potash salts as a by-product of beet sugar. It is estimated that the total potash in an average crop of sugar beets in the United States is about 20,000 tons. In the process of manufacture the potash remains in solution and is found in the final molasses. A portion of the molasses is used as feed for stock and the potash values in this case are recovered in proportion as the manurial values

The Giant Kelp of the Pacific Coast.

An organic source of potash. The Bureau of Soils is now obtaining potash from kelp in its plant at Summerland, Calif. During the war kelp was one of the most important sources of potash in this country.

from the feeding operations are utilized. A second portion is used in alcohol production, and the still residues containing the potash are concentrated and used as potash fertilizers. The remaining portion, amounting to about half of the total, is subjected to a treatment known as the Steffens precipitation process, by which the greater part of the sugar still contained in the molasses is precipitated. The filtrate, which is called Steffens waste water, contains the potash, and this may then be recovered by evaporating the solution. In 1919 the production of potash from molasses distillery waste amounted to 2,792 tons and from Steffens waste water 3,616 tons. The sugar industry thus came next to the saline lakes as a source of potash during 1919, but owing to the cost of concentrating the potash it is doubtful if any further increase in yield of potash will be obtained from this industry unless the waste waters are found to yield other products of value in addition to the potash.

Kelp differs from the other organic sources of potash in that most of the potash occurs in the plant in the same form



Bureau of Soils Potash Plant at Summerland, Calif.

An experimental plant developed to handle 100 tons of wet kelp a day and to produce therefrom 2 tons of potash salts, 1,500 pounds of kelp char, and other by-products.

as it is found in sea water and in many mineral deposits. It also differs from the other organic sources in that potash is the principal product for which the material is harvested. The commercial treatment of kelp for the production of potash salts began in 1915. In 1917 the quantity that was obtained from this source increased to 3,572 tons and in 1918 to 4,804 tons. Shortly after the signing of the armistice, however, all plants working in this field ceased operations, as it was apparently recognized that the processes used would not prove economical under normal conditions. As this result was anticipated, an investigation was undertaken by the Bureau of Soils in 1917, under special authorization of Congress, with a view to the possible development of a process that would yield products of sufficient value to place the industry on a permanent basis.

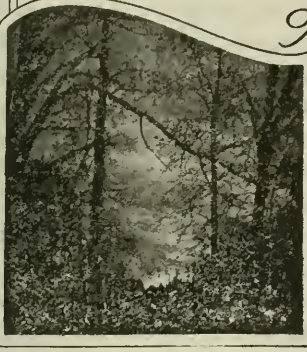
The process to which special attention has been given consists in subjecting the dried kelp to destructive distillation. By this treatment such products as ammonia, oils, creosote, and pitch are volatilized, while potash salts, iodine, and active carbon are recovered from the residue. This investigation is still in progress, but the results already obtained give promise that the different products that can be recovered in this way will yield sufficient revenue to enable the main product, potash salts, to be marketed successfully in competition with foreign sources.

In Case of Emergency.

The production of American potash increased from 1,090 tons in 1915 to a maximum of 54,803 tons in 1918 and then dropped to 30,899 tons in 1919 and to 48,625 tons in 1920. Of the total of 177,000 tons produced during this six-year period, 10 per cent was obtained from insoluble potash deposits, 70 per cent from soluble deposits, and 20 per cent from organic materials. The average annual importation for the six-year period preceding the war amounted to 230,000 tons. This dropped to a minimum of 7,885 tons in 1916, but increased again to about 200,000 tons in 1920, or more than the total produced in this country during the period of the war. Thus, notwithstanding the interest that has been taken in the matter, and the estimated expenditure of $50,000,000 in capital, we have as yet fallen far short of meeting our potash requirements. It is well to emphasize, however, that the time and effort that have been given to the subject have not been lost. It is possible that potash will shortly be imported more cheaply than it can be produced from most American sources, but the processes that have been developed during the last few years give assurance that in the case of future necessity it can be produced in unlimited quantity as occasion demands.

The value of the 177,000 tons produced in the United States during the war is estimated at $58,000,000, or about $46,000,000 in excess of the prewar price. These values and the large importation of 1920 would thus seem to indicate the necessity of further investigations on potash recovery if the cost of domestic production is to compete with that from foreign sources. The importance of this work might well be emphasized, even should it lead to no further advantage than to reduce expenditures in a future emergency.

FLOWERING and FRUITING of PLANTS as CONTROLLED BY THE LENGTH OF DAY



By W. W. GARNER, *Physiologist in Charge*, and H. A. ALLARD, *Physiologist, Tobacco and Plant-Nutrition Investigations, Bureau of Plant Industry.*

ONE of the most characteristic features of plant growth outside the Tropics is the marked tendency shown by various species to flower and fruit only at certain periods of the year. This behavior is so constant that certain plants come to be closely identified with each of the seasons, in the same way as the coming and going of migratory birds in spring and fall. In midwinter the blossoms of cyclamen, freesia, the brilliant color of poinsettia, and the fruits or berries of ardisia, all are reminders of the season; in spring we expect to see the unfolded blossoms of forsythia, wild violet, crocus, redbud, dogwood, and other typical plants; as summer approaches, poppy, rhododendron, iris, and columbine begin flowering; in the autumn salvia, aster, cosmos, dahlia, and chrysanthemum herald the approaching end of the open growing season.

The thought at once suggests itself that the underlying cause or causes of flowering or fruiting occurring only at a particular season must be purely internal, else the vagaries of the weather and other variable external conditions would seriously upset the regular cycle. It is true, of course, that plants can flower and fruit successfully only within certain limits of temperature and moisture supply, and it has long been known, also, that light is indispensable. Thus, plant development may be retarded in the spring by cool weather, and at times drought or excessive rainfall may interfere, but, in general, flower and fruit are produced regularly in their seasons in spite of these temporary disturbances. The ripening of seeds as a sequel to flowering is obviously of great importance to many plants, in that it affords the only means of avoiding extermination. We might easily conclude from this that the plant's entire activities are directed toward this means of propagation, all preliminary growth and development of root, stem, and leaf being incidental. This view, however, is not correct. The plant merely inherits the capacity to flower and fruit in response to certain favorable external conditions. It is both interesting and practically important, therefore, to determine these conditions.

While marked regularity in the time of flowering and fruiting is the rule in plants so long as they are grown in any particular locality in temperate regions, transferring plants from one region to another may greatly change their habits. A species which flowers and fruits readily in one region may become sterile in another, or, in some instances, the time of flowering may be changed from spring to fall, or vice versa. Again, plants behaving as annuals in one region may become biennials in another. These changes in the behavior of plants when grown outside their native regions furnish strong evidence that external conditions control the processes of flowering and fruiting and also suggest the possibility of artificial control.

Does Change in Temperature Account for Seasonal Flowering and Fruiting?

We instinctively think of temperature as the outstanding external factor causing one season to differ from another in its effects on plants. In particular, we associate the opening of spring flowers with moderate temperatures, following the chill of winter. Likewise, as the characteristic flowers of autumn make their appearance we have been inclined to assign decrease in temperature as the cause, mainly perhaps for the reason that there has seemed to be no other obvious cause for the flowering of these plants. Temperature unquestionably is a very important factor in plant development, and plants differ widely in their temperature requirements. Nevertheless, change in temperature fails to explain why plants flower and fruit at certain periods; that is to say, even though the appropriate temperatures are provided out of the regular flowering and fruiting season, as a rule the flower and fruit fail to appear except in their usual seasons. For example, common iris, which flowers in May and June, will not blossom under ordinary conditions when grown in the greenhouse in winter, even under the same temperature conditions that prevail in early summer. Again, one variety of soy beans will regularly begin to flower in June of each year, a second variety in July, and a third in August, when all are planted on the same date. There are no temperature differences during the summer months which could explain these differences in time of flowering; and, since "internal causes" alone can not be accepted as furnishing a satisfactory explanation, some external factor other than temperature must be responsible.

The ordinary varieties of cosmos regularly flower in the fall in northern latitudes if they are planted in the spring or summer. If grown in a warm greenhouse during the winter months the plants also flower readily, so that the cooler weather of fall is not a necessary condition. If successive plantings of cosmos are made in the greenhouse during the late winter and early spring months, maintaining a uniform temperature throughout, the plantings made after a certain date will fail to blossom promptly, but, on the contrary, will continue to grow till the following fall, thus flowering at the usual season for this species. This curious reversal of behavior with advance of the season can not be attributed to change in temperature. Some other factor is responsible for the failure of cosmos to blossom during the summer months. In this respect the behavior of cosmos is just the opposite of that observed in iris.

Certain varieties of soy beans change their behavior in a peculiar manner with advance of the summer season. The variety known as Biloxi, for example, when planted early in the spring in the latitude of Washington, D. C., continues to grow throughout the summer, flowering in September. The plants maintain growth without flowering for 15 to 18 weeks, attaining a height of 5 feet or more. As the dates of successive plantings are moved forward through the months of June and July, however, there is a marked tendency for the plants to cut short the period of growth which precedes flowering. This means, of course, that there is a tendency to flower at approximately the same time of year regardless of the date of planting. As a necessary consequence, the size of the plants at the time of flowering is reduced in proportion to the delay in planting. This behavior is well shown in figure 1, for all plantings had flowered when photographed. Like cosmos, the Biloxi soy beans show a marked tendency to flower at a definite season of the year, and if planted early they wait, as it were,

Soy Beans Planted at Regular Intervals during the Summer.

FIG. 1.—From left to right: Plantings were made at intervals of three to five days, beginning July 14. All plantings had flowered and growth had almost ceased when photographed September 8. The progressive decrease in vegetative development as the dates of planting become later and later is very striking.

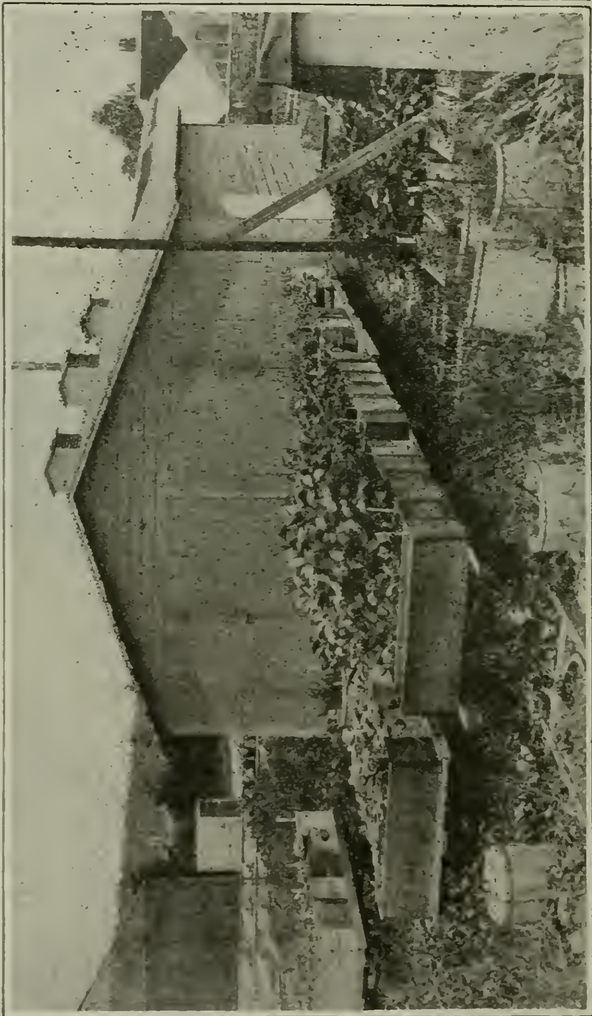
till this season arrives. It is easy to see the advantage which a plant has in being able to shorten the growing period which must precede flowering if, for any reason, the plant gets a late start. In such a case the chances of successfully maturing seed before frost and thus avoiding extermination in a given region are greatly increased, and the production of seed constitutes the plant's method of perpetuating itself in the face of the destructive action of cold. It is important, however, to make a distinction between advantage and cause with respect to time of flowering. The Biloxi soy beans by curtailing the period of vegetative activity when beginning growth late in the season are actually able to forestall the arrival of cold weather: hence, low temperature can not be considered as a cause of this behavior. The response of the soy beans to the advance of the season begins before there is any decrease in temperature.

Effect of Shortening the Duration of Daylight.

It is perfectly clear that the time of flowering and fruiting of many plants is inseparably linked in some way with the advance of the season, and necessarily there must be some external factor which maintains this relationship.

With temperature eliminated, there remains one change from season to season which proceeds with great regularity, namely, the change in length of day and night. At Washington, D. C., the time between sunrise and sunset ranges from nearly 15 hours in late June to about 9½ hours at Christmas. To determine whether this change in the length of day is a cause of regularity in the time of flowering and fruiting, a series of experiments was made in which a number of plants were darkened for a portion of the day during the long days of summer. The results obtained were remarkable. The plants no longer persisted in their usual habit of deferring the flowering period till a particular time of the year had been reached. The normal seasonal periodicity was completely broken up. The experiments included a large variety of plants both wild and cultivated, and it was found that the reaction to differences in the length of the day is of very wide occurrence.

The method followed in these tests is very simple. A "dark house" was so constructed as to admit air freely at the bottom and allow its escape at the top, without the admission of daylight. For convenience a series of small steel tracks leading into the dark house was provided, and on these tracks were mounted a number of trucks with steel wheels capable of supporting the containers in which the plants were grown. With this equipment it was a simple matter to transfer the plants into and out of the dark house at regular intervals each day. For example, if it were desired to give a particular lot of plants eight hours of light each day the truck bearing these plants would be rolled into the dark house at, say, 4 o'clock in the afternoon each day and rolled out into the open air again at 8 o'clock the following morning. The outfit



Dark House Used to Shorten the Daylight Period.

FIG. 2.—The receptacles in which the plants are grown are placed on trucks fitted with steel wheels. The trucks are run into and out of the dark chamber over steel tracks. In this way the plants receive only the desired number of hours of light each day.

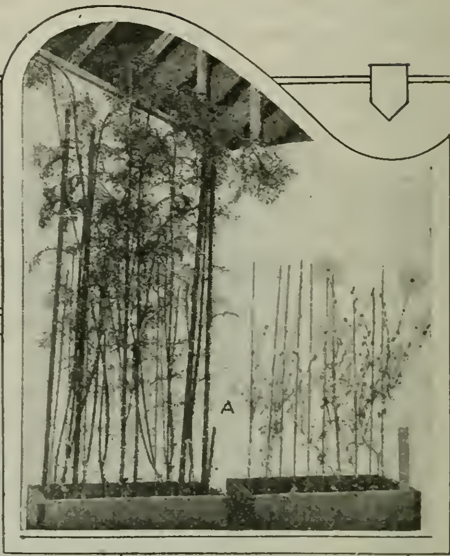
used in the experiments is well shown in figure 2. For comparison, in each test a second lot of plants, known as "control" plants, was grown under exactly the same conditions as those to which the darkened plants were exposed, except that the control plants were exposed to light throughout the day.

The response of the plants to this artificial shortening of the daylight period was prompt and clean cut. Biloxi soy beans which germinated May 17 were allowed to receive seven hours of light daily, beginning May 20. These plants were in blossom in 26 days, whereas a similar lot of plants exposed to light throughout the day required 110 days to flower. This variety of soy beans, which ordinarily flowers in September, even though planted in May, was forced into blossom in June, simply by shortening the daylight period. In further tests it was found that a daylight period of 12 hours was as effective as the 7-hour period in forcing the flowering of the soy beans. It is easily seen, therefore, why this variety of soy beans ordinarily does not flower till September, for it is at that time that the length of the day is reduced to 12 hours.

An experiment was made with another variety of soy beans known as Peking at the same time and in the same way as with the Biloxi. In this case the plants receiving 7 hours of light daily flowered in 21 days, while those exposed to light for the entire day required 62 days to reach the blossoming stage. This is fully in accord with the fact that the Peking regularly blossoms in the field in July, two months in advance of the Biloxi. The Peking, therefore, is capable of flowering under a considerably longer day than the maximum day length which will cause the Biloxi to blossom.

A common wild aster which ordinarily flowers in September was found to behave in the same manner as the Biloxi soy beans when exposed to a shortened daylight period. When exposed to 7 hours of light daily the aster was in bloom in 36 days, as against 122 days when exposed to light for the entire day. A variety of Lima bean imported from Peru which ordinarily does not flower till late in the fall at Washington, D. C., was caused to blossom in 28 days by reducing the daily light period to 7 hours. The common ragweed behaved in a similar manner.

FIG. 3.—*A*, Cosmos requires comparatively short days in order to flower. These plants were grown in the greenhouse during the short days of winter. The plants on the left received electric light after sunset, so as to prolong the daily light period, and thus were prevented from blossoming. This explains why cosmos does not flower during the summer months, the days being too long.



Some Effects of Short Daylight Periods.

FIG. 4.—*B*, Forcing flowering and fruiting in soy beans by shortening the daylight period. The plants on the left were exposed to the full day length of summer, while those on the right received only 10 hours of light each day, all other conditions being the same. Many plants will not flower and fruit when the days are long.

FIG. 5.—*C*, Chrysanthemums are made to flower in summer by shortening the daylight period. The plant in blossom on the left was allowed to receive only 10 hours of light daily, beginning May 12, and the first blossoms opened July 17. The plant on the right, receiving light during the whole day, did not flower till fall.

One scarcely expects to see chrysanthemums in bloom in midsummer but, as is indicated in figure 5, these typical fall-flowering plants are readily made to flower in summer by shortening the length of the daily light period. Late-flowering varieties of dahlia are readily forced into blossom during the summer by reducing the length of the daily light exposure to 10 hours or less. A highly colored specimen of poinsettia, the plant so typical of the Christmas season, was developed in August by reducing the daily light period to 10 hours.

In the light of these experiments there is no longer any element of mystery concerning the fact that when plantings of cosmos are made at successive dates in early spring a point is reached at which the plantings suddenly swing over from flowering in the spring to flowering in the fall. Cosmos begins to flower in the fall when the length of day has decreased to about 12 hours (sunrise to sunset) and, in the same way, it is no longer able to flower in the spring after the days become much in excess of 12 hours in length.

There is, then, a large group of plants, including most of the so-called summer annuals, which regularly flower after midsummer as a result of decrease in the length of the day. While relatively short days favor flowering and fruiting in these plants, long days are more favorable to rapid and extensive vegetative development. Some of these plants, therefore, if they receive the full benefit of the long days of summer, may reach giant proportions before being brought into the flowering condition. Thus, we can understand why it is that when the farmer plants some crops too early, there is a tendency toward excessive development of leaf and stem with little flowering or fruiting. Late planting, on the other hand, may lead to dwarfing in growth but abundant flowering and fruiting. Again, it is easily seen why carrying some plants into northern latitudes causes very rank growth, with a tendency toward barrenness, since the length of the day in summer increases as we go northward. Plants in this group differ widely as to the extent to which the longest summer days must be shortened to induce flowering, with the result that some flower in July while others may not flower till November. Even the latest of these are readily forced into flowering and fruiting during the hottest part of the summer simply by shortening the daylight period, so that there is no reason for considering the cooler weather of fall as a factor of importance.

Effect of Darkening Plants in the Middle of the Day.

FIG. 6.—*A*, The Biloxi soy beans in box on the right were exposed to light from daylight to 10 a. m. and from 2 p. m. to dark, in all 9 to 10 hours daily. The plants in the box on the left were exposed to light from 6 a. m. to 6 p. m., 12 hours daily. The 4-hour period of darkness in the middle of the day was not effective in hastening flowering and the ripening of seed, although the plants thereby received less than 12 hours of light daily.

Red Clover Flowers under the Influence of Long Days.

FIG. 7.—*B*, The plants in the can on the left were exposed to the light for only 10 hours daily, while those in the can on the right were exposed throughout the day during the spring and early summer. Long days favor flowering in this type of plant. The prostrate habit of growth during the short days of winter is characteristic of this group of plants.

A modification of the method of shortening the daily light period used in the above-mentioned experiments gave somewhat surprising results. Instead of giving Biloxi soy beans a single exposure to light each day, they were transferred into the dark house at 10 o'clock in the morning and returned to the light at 2 o'clock in the afternoon. As is shown in figure 6, the midday period of darkening was almost without effect in hastening flowering, although the two daily light periods aggregated considerably less than 12 hours in duration.

Another important feature of the effect of shortening the daylight period should be mentioned. Just as many plants may be forced into flowering by artificially shortening the daylight period, so also is the ripening of the fruit or seed greatly hastened. Thus, in a test with Peking soy beans, two similar lots of plants were grown under natural summer conditions of daylight till flowering had taken place and very small seed pods could be seen. At this stage one lot of plants was darkened for a portion of the day, so that they received only 7½ hours of light daily, while the second lot continued to receive light during the entire day. The result of the test is indicated in figure 8. Six weeks after flowering, the leaves were falling from the plants which received the shortened light exposure, and some of the seed pods were fully ripe. The plants under the natural length of day did not mature their seed till several weeks later. Several other plants have responded in a similar manner to artificial shortening of the daylight period.

Some Plants Require Long Days for Successful Flowering and Fruiting.

In striking contrast with the group of plants already discussed is a second group regularly flowering in late spring and early summer. It is obvious that these plants do not require short days to reach the flowering stage. On the contrary, it has been found that short days prevent, or at least greatly delay, flowering and fruiting. To this class of plants belong the so-called winter annuals; also many of our common vegetables. The radish has given some interesting results which are fairly typical for the group. The ordinary varieties of radish when planted in the spring first produce a thickened edible root and somewhat later develop a flowering stem, which in due season matures seed. Thus the Scarlet Globe variety, planted May 15, began to blossom June 21 when exposed to the natural length of day.

A similar planting, made at the same time, but allowed to receive only 7 hours of light daily, grew slowly and

The Length of the Day is a Controlling Factor in the Ripening of Seeds and Fruits.

FIG. 8.—*A*, Peking soy beans which were exposed to light during the entire day in summer till flowering had taken place, but thereafter were allowed to receive only 7½ hours of light daily. *B*, Peking soy beans exposed to light during the whole day throughout the test. The two lots of plants are of the same age and were treated exactly alike except as to the length of the daily light exposure after flowering had taken place.

formed no flowering stem. Under the shortened daylight period the roots of the radishes continued to enlarge slowly throughout the summer, with a corresponding increase in size of the rosettes of leaves surmounting the roots. One of the plants which was transferred to the greenhouse in the fall continued its slow growth through the winter months. Finally, as the days lengthened in early spring this plant was able to send up a flowering stem and perished after seed formation was completed. Thus the radish, which ordinarily is a typical annual, was made to behave as a biennial. The radish furnishes a case in which flowering may be prevented for a more or less indefinite period by shortening the daily period of illumination, in contrast to the group of plants previously considered, which are prevented from flowering by long days and are forced into flowering by shortening the daylight period.

The behavior of the radish is in no sense exceptional. Failure to send up a flowering stem during the short days of winter and early spring is a characteristic feature of many hardy plants which maintain more or less vegetative activity at those seasons of the year. The tendency is toward a prostrate type of growth, with free stooling or a rosette form of leaf development. As the longer days of spring come on, the character of growth changes, and upright-growing stems appear, in preparation for flowering and fruiting. Our small grains belong to this class of plants. Red clover furnishes a good illustration of this behavior, as may be seen by referring to figure 7. By allowing the test plants to receive only 10 hours of light daily, the prostrate nonflowering type of development was continued long after a corresponding lot of plants which were exposed to light all day had developed upright stems and had successfully flowered and fruited. Likewise, the common evening primrose transplanted from the field in early spring continued the prostrate rosette type of development for several weeks when allowed a daylight period of only 10 hours, whereas similar plants exposed to light throughout the day quickly developed tall, erect flowering stems.

Under ordinary conditions spinach can not be grown successfully for table use during the summer months, because it quickly goes to seed instead of forming the desired rosette of large leaves. This behavior has been generally attributed to high temperature. It is quite true that within suitable limits an increase in temperature, as a rule, speeds up plant development. Nevertheless, experiments have shown that spinach will produce an excellent rosette in summer if the light period is reduced to 8 or 10 hours. Under these conditions the flowering stems are unable to form, or, at least, their appearance is greatly delayed.

Tubers of the groundnut (Apios) planted on March 11 sent up shoots which appeared above the ground on April 6. By April 20 flower buds were showing on all these plants. On one lot which was exposed to light all day, the first open blossoms appeared June 1, and flowering continued till late in August. On a second lot which received only 10 hours of light each day, beginning May 20, only one or two blossoms were able to open, the other flower buds dropping off. Thus, in spite of the fact that the flower buds had been laid down before the daylight period was shortened, these buds were unable to unfold under the new conditions.

The above examples illustrate the fact that there is a large group of plants which are brought into the flowering and fruiting stages of development because of the increase in length of day as spring advances into summer. As a matter of convenience in discussing flowering and fruiting activities, this group may be spoken of as "long-day plants," in contrast with the group previously discussed, which are forced into flowering and fruiting by the shortening of the days in fall and therefore may be called "short-day plants." While as a whole there are sharp contrasts between the two groups, there are many plants which perhaps may be regarded as occupying an intermediate position. There is, in fact, no hard and fast line between these two classes of plants. There are some plants, indeed, for which it is possible to provide a daylight period too long, on the one hand, and too short, on the other, to induce flowering and fruiting.

It has already been pointed out that while the short-day plants are diverted toward the flowering and fruiting, or reproductive, stage of development by shortening the daylight period, the rate and amount of vegetative growth, on the other hand, are increased in proportion to the lengthening of the daylight period. In the case of the long-day plants the reproductive stage is induced by a lengthening of the daily period of illumination, so that vegetative growth is necessarily restricted more or less through the influence of long days. This refers more particularly, however, to the final size attained by the plant rather than to the rate of growth. For example, as already has been detailed, long-continued exposure to a short day length eventually produced a radish of exceptionally large size, but it required nearly nine months to accomplish this result. The rate of growth was less than when the radish is exposed to the light for the whole day in summer. It is true, however, that there are plants whose rate of growth is less during the longest days of summer than during the days of spring and fall, which are of intermediate length.

How Length of Day Controls Everflowering and Everbearing.

In temperate regions most plants have a comparatively short period of flowering and fruiting each year, though plants differ in the length of this period. In some cases, however, this period of reproductive activity continues through several months, and plants behaving in this manner are known as everbloomers or everbearers. In the preceding discussion the fact is brought out that most plants tend to continue the purely vegetative form of development as long as the days are of a certain length, while under another length of day vegetative development quickly gives way to flowering and fruiting. Not all plants are equally sensitive, however, to changes in the length of day. With these two fundamental facts in mind it is easy to understand the relation of the length of day to the condition in plants known as everblooming or everbearing. If Biloxi soy beans or cosmos plants are subjected to an artificially shortened period of daylight of 9 or 10 hours in midsummer the purely vegetative form of activity is promptly checked and flowering and fruiting quickly follows. Subjecting Biloxi soy beans to a somewhat longer daylight period of 12 hours in midsummer has resulted in a considerably larger stature for the plants, and blossoming has been considerably delayed. Furthermore, lengthening the daylight period from 10 hours to 12 hours has markedly slowed down the rate of development of the pods, and consequently the ripening of the seed. In other words, we have been working in the direction of vegetative activity and to a greater or less degree away from the condition of free and rapid flowering, ripening of seed, and final death of the plants. This suggests the possibility of a nice balance or adjustment between the vegetative and the reproductive phases of development which would express itself in more or less prolonged everblooming and everbearing tendencies. From this viewpoint the everflowering tendency simply means the ability to continue both vegetative and reproductive activities more or less successfully together.

Two features of the relationship between length of day and everblooming are of special importance, namely, (1) the occurrence in different latitudes of the proper range in length of day continuing over a sufficiently long season and (2) differences among plants in their sensibility to changes in length of day. In the case of those plants which are readily changed from the vegetative to the reproductive form of activity by a change in the length of the day, the proper intermediate length of day favorable to both forms of activity must persist over a sufficiently long period if we may expect the everblooming habit to appear. As one advances from the poles toward the equator both the seasonal and the daily changes in length of day decrease till at the equator a fixed day length of 12 hours prevails the year round. In extreme northerly or southerly latitudes, on the other hand, there is a constant and relatively rapid change in length of day. It is clear that under these latter conditions the tendency would be for plants to be swept rather rapidly through the particular range in day length which would permit the vegetative and reproductive activities to proceed simultaneously. Therefore, there would be little opportunity for the everblooming habit to develop in far northerly or southerly regions, even during the open growing season. In these regions everflowering would be confined mostly to those plants which happen not to be particularly sensitive to changes in the length of day. For plants having a daylight requirement for both growth and flowering ranging around 12 hours, conditions at the equator would be ideal for the development of the everflowering habit. As a matter of fact, everflowering is a characteristic feature of plant life in the Tropics, and this form of reproductive activity steadily becomes less prominent as we advance toward the poles. In temperate regions comparatively few plants can be regarded as typical everbloomers.

By suitable control of the daylight period the explanation of everflowering offered above can be directly tested. With a daily light period intermediate between that required to induce free flowering and that which favors vegetative development exclusively a given plant should continue to flower for a more or less indefinite length of time so long as the light period is held constant. For example. one of our common wild violets (*Viola papilionacea*) after a brief period of winter dormancy renews its activity in early spring by unfolding new leaves. A little later the familiar blue spring blossoms make their appearance. As the longer days of May and June come on vegetative activity is increased, there is greater development of foliage leaves, and the characteristic blue blossoms disappear. Obviously, these plants are approaching a strictly vegetative form of activity. In reality. however. flowering in the botanical sense does not cease. for in place of the showy spring blossom a peculiar type of flower is produced beneath the leaves which does not open, though it produces seeds. This appears to be a case of fine adjustment to day length, for evidently the peculiar summer type of flowers represents a stage nearer the purely vegetative condition than does the richly colored spring blossom. Now, when these plants were allowed to receive only about 8 hours of light daily they continued to produce only the blue spring type of blossom and made but little vegetative growth. Surprising as it may seem, by this method the plants were kept in bloom constantly from March till November, with a minimum growth. Flowering finally ceased only because the daylight in December fell below the minimum requirement. so that the plants were forced into dormancy.

But, by keeping the plant under a daylight exposure in excess of 12 hours, it is possible, also, to maintain this violet for an indefinite period in the more nearly vegetative condition of midsummer, in which the inconspicuous, nonopening type of flower is formed. As will be explained later, this may be done by the use of artificial light after sunset to prolong the daily light period. Thus, in the broadest sense, this plant is in blossom from early spring till late fall under the natural range in length of day in our latitude. Considering either of its two alternative forms of blossoming separately, however, the violet behaves as a true everbloomer only when, by artificial means, the appropriate length of the daylight period is held approximately constant. Thus, two distinct types of everblooming are possible in this violet, involving the formation of different sorts of blossoms, and both types of everblooming can be produced at will by artificially regulating the daily light period. This plant furnishes a striking example of the marvelously fine balance between vegetative and reproductive activities which the length of the day controls.

Other plants have shown similar tendencies toward everflowering when exposed to a suitable, fixed illumination period. In fact, under these conditions there is a tendency in plants generally to become everbloomers. Under natural conditions, however, the seasonal change in day length in our latitude is such that only a few of our plants show a pronounced type of everblooming. A number of our common weeds, including the ubiquitous chickweed and the dead nettle (Lamium), are of this class. These plants continue to grow and to flower more or less persistently throughout the winter in the warm greenhouse, and likewise in the field throughout the summer. Such plants stand out conspicuously as essentially different in this behavior from the majority of our plants, which have their definite floral seasons.

Electric Light to Prolong the Daily Light Period.

In summer the daily light period is readily shortened by use of dark chambers, into which the plants are placed for a portion of the day. In this way various plants may be forced into flowering and fruiting out of their natural season, or plants normally flowering and fruiting in summer may be prevented from doing so. On the other hand, to initiate flowering out of season in long-day plants during the short days of winter, or to prevent its occurrence in short-day plants, it would be necessary to lengthen the daily period of illumination. With this in view, a greenhouse was fitted with a series of 40-watt electric lights, evenly distributed overhead, so that an average intensity of about 3 to 5 candlepower was obtained immediately above the soil surface. The electric light was used from sunset till about midnight each day. The intensity of the light used seems insignificant in comparison with daylight, which on clear days in winter may reach as high as 5,000 foot candles or more. Yet some striking results were obtained. For comparison, plants were grown in a similar greenhouse without the use of electric light.

As a general proposition, the long-day plants, so called, should tend to remain in the purely vegetative condition in the "control" house without electric light and hasten toward reproductive activity in the electrically lighted house. Short-day plants, on the contrary, should flower readily in the control house and assume a purely vegetative form in the illuminated house. In the control house cosmos has invariably flowered, showing reproductive tendencies when very small. Flowering actually took place within 50 to 60 days from germination. In the illuminated house the plants grew vigorously, greatly exceeding the control plants in stature, and showed no indications of flowering, months after the controls had flowered. These plants were removed from the illuminated greenhouse in June and placed out of doors, where they received only the normal daylight of the long summer days. Under these conditions the plants remained in the actively growing, sterile, vegetative stage and did not flower till they had reached a height of 15 feet in October, when they were finally forced into the reproductive stage by the natural decrease in day length.

Various species of beggar-ticks (Bidens), comprising some of our best known and most persistent weeds in moist, rich bottom lands, have shown a behavior similar to that of cosmos. In response to the short winter days, these have quickly flowered in the control house when only a few inches high, and flowering in turn has been promptly followed by the decline and death of the plants. This is just the way these plants behave when subjected to an artificially shortened daylight duration of 9 to 10 hours in midsummer. In the greenhouse where the daily duration of light had been artificially lengthened by electric illumination the plants behaved just as they have done during the midsummer period of longest days—i. e., grew to great stature, with no indications of flowering. To make these results even more striking, plants of various ages and statures were from time to time transferred from the illuminated house to the control house, where they at once came under the influence of the relatively very short daylight duration of the winter time. Within a few weeks flowering was initiated simultaneously on all the branches, and decline and death of the plant ultimately followed. This is just what happens in summer time when out-of-door plants are suddenly subjected to artificially shortened daylight periods of 9 to 10 hours' duration.

In the control house, where no electric light was used, the Peking and Biloxi varieties of soy beans, although producing only a dwarfed growth, flowered in the characteristic winter manner, i. e., with the production of poorly developed blossoms. This is also the behavior of these plants when grown under the influence of artificially shortened daylight in summer time. In the illuminated house, on the other hand, vegetative growth was favored and the plants reached an unusually large stature without flowering, thus showing a general similarity to their summer behavior when the days are long.

In the above plants the purely vegetative development is favored by long days, and flowering is initiated when the days have been sufficiently shortened. We will now consider the behavior of iris, which flowers during the long days of May and June. Plants taken from the field in autumn started into growth at once and flowered within 55 to 60 days in the house where electric illumination was used from sunset till midnight to supplement the short daylight period of the winter season. In the control house the plants remained practically dormant vegetatively until March or April, since they showed practically no growth, and flowers did not appear till June. In spite of the warm temperatures in the control greenhouse, this plant was unable to flower in winter because the days were too short. In the same way the common goldenrod, which regularly begins flowering in

June, was readily forced into flowering in winter by the use of the electric light, whereas without electric light no flowering stem was formed, even after an exposure of several months to short-day conditions. Spinach planted in the house provided with electric light on November 1 was in bloom in six weeks, while in the control house the plants remained in the rosette stage throughout the winter.

The above examples are enough to show that artificial light of low intensity used to prolong the daily illumination period during the short days of winter effectively prevents many short-day plants from flowering and is equally effective in forcing long-day plants into flowering and fruiting. In other words, comparatively weak artificial light used as a supplement to daylight of short duration during the winter will produce much the same effects as the daylight of long duration in summer.

In the above-mentioned tests the electric light was supplied by 34 tungsten filament lights of 40 watts each evenly distributed beneath the glass roof of a greenhouse 50 feet long, 20 feet wide, and 12 feet high to the ridge. While the average intensity of 3 to 5 foot candles thus obtained was sufficient for many plants, it was found that others require higher intensities. The number of hours of artificial light needed after sunset, of course, depends on the particular plant concerned, since each variety and species has its own requirements as to duration of the light period. Naturally, the best indication of this requirement is the prevailing length of day at the regular season of flowering for the plant under consideration.

Practical Uses of the Discovery.

The experiments briefly discussed in this paper have opened a wide field for experimentation and study. The full significance of the discovery that the activities of plants are profoundly influenced by seasonal change in the length of day can not be understood until the field has been more fully explored. At present it is possible only to indicate broadly some of the directions in which it seems most likely that practical application of the principles involved can be made.

A correct interpretation of the effects of length of day upon the plants will be a great aid in reaching a better understanding of the causes which limit the natural habitat of most plants, a problem which has been a difficult one to solve. To the farmer, the facts which have been established will strongly emphasize the importance of accurately knowing the correct season for planting each of his crops in order to secure the highest returns. Under some conditions a difference of no more than 10 days in time of planting would definitely direct the plant's activities toward either the purely vegetative or the reproductive form of development, as the case may be. Now, in one case the farmer may be chiefly concerned with extensive vegetative growth, while in another he may be interested primarily in flower, fruit, or seed development. Of course, much has already been learned empirically as to the proper time of planting various crops, but recognition of the importance of the relative lengths of day and night as a factor in a measure reopens the question.

The plant breeder should be able to gain a better insight into some of his problems, such as securing for any particular region earlier or later varieties, more fruitful or larger growing forms, and improved everbloomers and everbearers. In the same way the problem of extending the northern or southern ranges of crop plants may be more clearly defined. In many cases breeding work can be hastened through artificial control of light duration, which will make it possible to work more or less independently of natural conditions of day length, both as to time of year and as to geographical location of the worker. It often happens that plant breeders are unable to make crosses between certain plants because of differences in time of flowering of the two parental types. In such instances artificial control of the daily light period should be of great value, for in this way the date of flowering can be accurately controlled. The plant introducer will have at his command a more adequate basis for analyzing the factors which determine whether any particular plant is adapted to a new region. Moreover, in special cases it may be possible to introduce successfully new plants through artificial control of light conditions or by taking fuller advantage of seasonal differences in length of day.

Solution of the Problem of Seed Production in the Maryland Mammoth Tobacco.

FIG. 9.—*A*, The plant at the left, which was grown in the greenhouse in winter, shows the characteristic behavior of the Mammoth tobacco when propagated under a short day length. The plant at the right was grown under exactly the same conditions except that the daylight period was lengthened by the use of the electric light, and flowering thus prevented. The plant does not flower in the field in Maryland because the days are too long.

B, A crop of Maryland Mammoth tobacco estimated to yield 2,000 pounds or more per acre. Under the influence of the long summer days exceptionally large yields may be obtained with this variety in southern Maryland, but the plants normally fail to mature seed. The seed may be readily obtained by growing the plants in southern Florida in winter, thus exposing them to short days.

Within suitable limits of temperature and other important factors in plant growth, there would seem to be no reason why almost any plant may not be made to flower and fruit at any season of the year and in any region. By shortening the daily light period through the use of dark chambers or lengthening it by means of artificial light, reproductive activities may be induced almost at will. With proper knowledge of the specific requirements of each plant, therefore, the florist should be able to force flowering at any desired time of the year. It has been possible to secure excellent flowering specimens of iris in midwinter and chrysanthemum, poinsettia, and other plants in summer by utilizing these principles. In the same way wild violets have been kept in the everblooming stage as long as 9 months. The principles involved are so simple that anyone interested in plants can easily obtain instructive and convincing results.

In conclusion, it may be of interest to cite a specific instance in which the day-length effect has been applied to the solution of a practical problem in tobacco culture. Several years ago a new type of tobacco was discovered in southern Maryland. Under suitable conditions this type grows to an unusually large size, the plant in some cases producing more than 100 leaves; hence the name Maryland Mammoth by which this variety is known. Because of its high yielding capacity this variety has been grown with great success in southern Maryland. An excellent crop of Mammoth tobacco is shown in figure 9. A peculiarity of this tobacco is that either it does not flower at all in the field in Maryland or flowering occurs so late in the season that the seed does not mature. Farmers, therefore, can not obtain seed by the usual methods. It was found, however, that Mammoth tobacco flowers very readily in the greenhouse under the natural day length of winter, whereas artificial lengthening of the daily light period of winter prevents flowering, as shown in figure 9. The plant does not flower in the field in Maryland, because the summer days are too long. The problem of securing seed is easily met by growing the plants in southern Florida during the winter, for under these conditions the Mammoth flowers and fruits much the same as the ordinary varieties of tobacco.

COWS THAT MAKE THE INCOME CLIMB

By J. C. McDowell,
Dairy Husbandman, Dairy Division, Bureau of Animal Industry.

LAST SUMMER, while visiting the Eastern Pan Handle Cow-Testing Association in West Virginia, I saw a fine young herd of registered dairy cattle. As I stepped into the clean, well-lighted, well-built dairy barn the owner said to me: "It's between me, these cows, and the sheriff. Because my capital is limited my cows have got to pay; if they don't the sheriff will sell me out. My cows must pay and to make sure they will I must know their individual records. That's why I belong to the cow-testing association."

That man's cows are paying because he knows their records and feeds according to production.

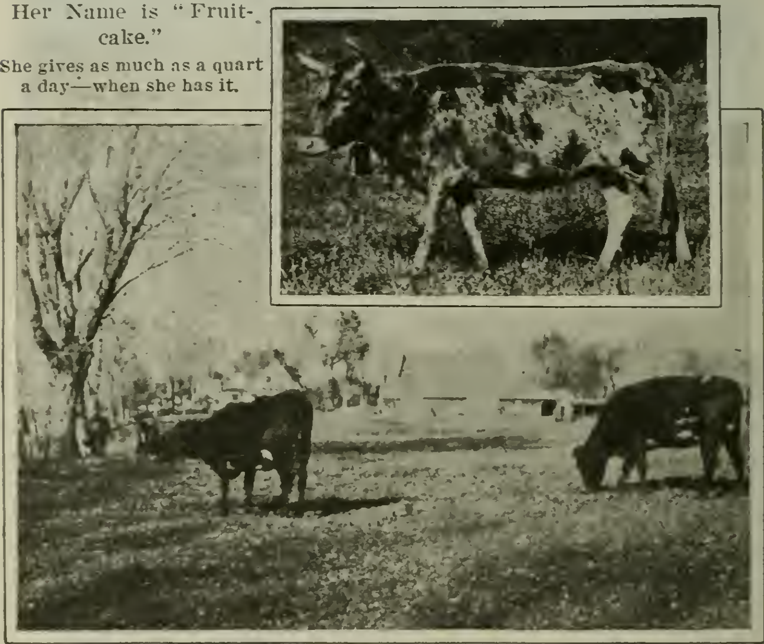
Hundreds of millions of dollars' worth of feed are consumed annually by our dairy cows. The net income is large or small, according to the way that feed is used. When production is increased through feeding and breeding, the income rapidly expands, yet a few real scrubs on any dairy farm will deflate the net income.

In this country 5,000,000 farmers furnish feed and care for 23,000,000 dairy cows. Because of low-producing dairy cows a large part of that feed is wasted. Weighing out expensive feeds to a low-producing cow is like shoveling costly coal into the fire box of a leaky boiler; and the farmer who keeps such cows is seldom bothered with an income tax.

Like a factory, the dairy cow transforms raw materials—silage, hay, and concentrates—into the finished product—milk. In that way she furnishes a market for our feeds. Whether that market will be good or bad depends in part upon the way the cow is fed and in part upon the cow.

Her Name is "Fruit-cake."

She gives as much as a quart a day—when she has it.



Inferior Cows of Mixed Breeding.

The farmer who keeps such cows is seldom bothered by an income tax.

Selling Feeds to the Cow.

There is no better way to market the feeds grown on the farm than to feed them to a high-producing herd of dairy cows. The cow takes corn silage, grain, and clover hay and converts them into a product for which there always is a ready sale. It is much easier to send the butterfat to the creamery than to haul the hay to town. Yes; and in the long run it is generally much more profitable, because it keeps the soil fertility at home. Instead of selling hay and grain that may go to enrich the soil in some far-distant State, or in a foreign country, the wise dairy farmer markets such products through high-producing dairy cows.

In selling feeds to dairy cows the farmer has a wide choice of markets—bad, good, and very good. Few men discriminate closely enough between these markets. If a wheat buyer offers a cent or two a bushel more than other buyers he gets our wheat; if a wool buyer offers half a cent a pound

Let Dairy Cows Market Your Pasturage.

Here is one place where the farmer has the market largely under his control.

Live Stock Maintains Soil Fertility.

Keeping dairy cows keeps the richness of the land at home.

more for our wool we sell our wool to him; but if one cow returns $3 from a dollar's worth of feed and another only $2, we scarcely notice it. Here is a difference of a dollar every time each of these two cows eats a dollar's worth of feed, and frequently within a year this difference is enough to buy a hundred-dollar Victory bond. I believe much more attention would be given to a choice of cows if we would think of them as markets for our labor and for corn silage, concentrates, and clover hay. Here is one place where the farmer has the market largely under his control.

Room for Improvement.

According to careful estimates, the average dairy cow in the United States produces annually about 4,000 pounds of milk and 160 pounds of butterfat. According to 40,000 yearly individual cow records just tabulated by the Department of Agriculture, the average cow-testing association cow produces 5,980 pounds of milk and 246 pounds of butterfat a year. The world's records are 37,381.4 pounds of milk and 1,205.09 pounds of butterfat. The average dairy cow seems to have plenty of room for improvement.

Record Keeping Easy.

The keeping of individual cow records is easy. To test a half dozen samples of milk for butterfat requires about half an hour, and the weighing of the milk, the estimating of the weight of the roughage, and the weighing of the concentrates require but little time. The testing of a composite sample of each cow's milk from two consecutive milkings once a month furnishes the figures from which the yearly production records can be computed. Any man competent to care for a dairy herd can easily learn to make the butterfat test and to keep feed and production records.

In Old Virginia.

A dairyman in Virginia says that when he began testing for production he had a herd of 31 cows. There being no cow-testing association in his neighborhood at that time, he did the work and kept the records himself. After weighing and testing the milk for a few weeks he reduced the number of cows to 26. These he fed according to known production and obtained a higher total yield than had formerly been obtained from the larger herd. Before the end of the year he reduced the number of cows to 20, and the 20 produced more than the 31.

Through rigid culling and feeding according to production the herd was finally reduced to 10 well-bred, well-fed cows, and the 10 produced almost as much milk and butterfat as the 20. Since then the herd has gradually been increased in numbers until to-day it consists of 20 cows, and the 20 produce annually more than twice as much milk and butterfat and many times as much net profit as was produced by the old original herd of 31 cows.

Cow Testing Worth While.

Is cow testing worth while? Ask the dairyman who has recently joined a cow-testing association and he will seldom answer "No." Ask the dairyman who has seen the profits of his herd more than doubled through the work of the association and he will never answer "No." Ask the breeder of high-class, purebred dairy cows after he has sold a bull calf from a record cow for a thousand dollars, and he will always answer "Yes."

Cow testing is not worth while to the dairyman who makes no use of the records and who continues the doubtful practices of former years, but cow testing is worth while to the dairyman who desires to feed and breed according to known production. In dairy-herd improvement, knowledge alone is nothing, but knowledge followed by intelligent action is everything. To the man who belongs to a cow-testing association, who studies the individual records of his dairy cows, and who selects, feeds, and breeds according to these records, cow testing is and always will be well worth while.

It Pays to Know.

The dairyman who knows the records of his cows is usually the owner of a herd that yields a profit. The relation between production records and profits is quite evident, but it is not so easy to see a relation between profits and the owner's knowledge of such facts as age of cow and date of freshening. Certainly a cow does not give more milk and butterfat because the owner knows her age and date of freshening, yet it is undoubtedly true that the man who knows these things is generally a better dairyman and gives his cattle better care than the man who keeps no records of his cows. From the department's study of 40,000 yearly individual cow records it is quite clear that the dairyman who does not know such facts is usually the owner of cows whose production and profits are below average.

In the White River Junction (Vermont) Cow-Testing Association the cows whose ages were not known averaged

552 pounds of milk below those whose ages were known. In butterfat production they were 27 pounds below and in income over cost of feed they were $10.78 below the average of those whose ages were on record.

In the Lenawee County (Michigan) Cow-Testing Association the records of the 33 cows whose owners did not know the date of freshening were relatively low all along the line. In milk production their average for the year was 2,536 pounds below the average of the others. In butterfat production they were 79 pounds below, and in income over cost of feed they were $37.06 below the average of those cows whose owners knew the dates of freshening. Evidently in dairying for dollars it pays to have a fairly complete knowledge of the records of our cows.

Feed According to Production.

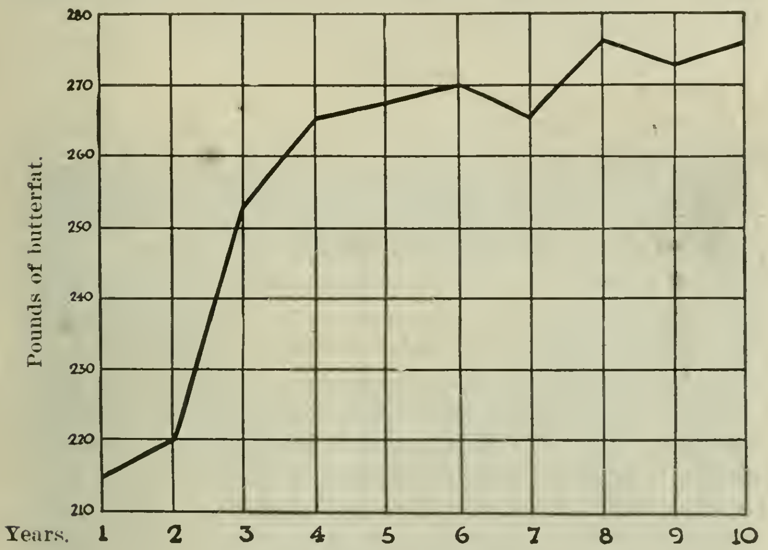
Weighing out the proper rations requires but little time.

Careful Selection Increases her Efficiency.

Like a factory the dairy cow transforms raw materials into the finished product—milk.

Ten Years of Progress.

The United States Department of Agriculture now has figures that give 10 years of progress in the first cow-testing association organized in the United States, the Newaygo



The Evidence.

Ten years of progress in the first cow-testing association in the United States, Newaygo County, Michigan. See how butterfat production climbed in the herds of this association.

County (Michigan) Association. The first year the average production of milk was 5,354 pounds; the tenth year it was 6,637 pounds. The chart shows the yearly change in average production of butterfat per cow. The gain was quite rapid until average production of butterfat had reached a relatively high level. From that time on it was not so easy to make great gains, yet at no time was there a falling back to the low levels of former years. The first year the average production of butterfat was 215 pounds, the sixth year it was 270 pounds, and the tenth year it was 276 pounds.

This is not a wonderful gain, but it is a gain that is well worth while. Figures from other associations are sometimes more striking, but we do not yet have figures for so long a period from any other cow-testing association. Successful though it was, the work of the Newaygo association was stopped by the war before the end of the eleventh year. At the end of the tenth month of the eleventh year the tester, who was then keeping the association records, resigned to go into the Army and fight on European battlefields.

"Goldie."

Before a certain Missouri farmer joined the cow-testing association he owned a good herd in which was an old crippled cow named "Goldie." At that very time the owner was trying to sell her for $75. To his great surprise the milk scales and Babcock test not only placed poor old crippled Goldie at the head of the herd but at the head of the whole association. Her yearly production as shown by the records was 9,300 pounds of milk and 526 pounds of butterfat, and her yearly earning over cost of feed was $267.

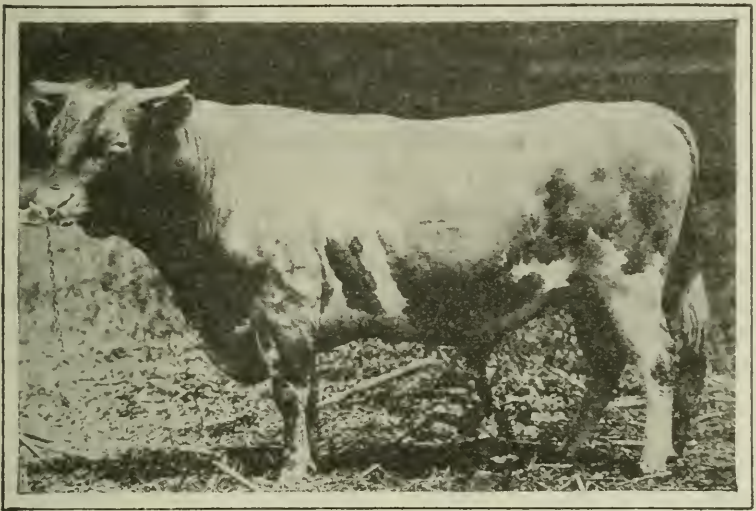
Goldie belonged to a herd whose average yearly butterfat production was 360 pounds, yet in production of butterfat she was almost 50 per cent above the average of the herd. In production of butterfat she was more than 200 per cent above the average dairy cow of this country. Among the cows on test in the 468 cow-testing associations there are many like Goldie. The true production records furnished by cow-testing associations have prevented the sale of a large number of unassuming but fairly high-producing cows.

A and Z.

In a certain association 511 cows were on test. Mr. A owned 16 cows whose average butterfat production was 306 pounds. Mr. Z owned 91 cows whose average was 155 pounds. For Mr. A's herd the average income over cost of feed was $75, and for Mr. Z's herd, 64 cents. The average cow in the herd belonging to Mr. A produced more income over cost of feed than all of the 91 cows in the herd belonging to Mr. Z. It would require 117 cows like those in Z's herd to produce as much income over cost of feed as was produced by the average cow in A's herd. Evidently Mr. A is dairying for dollars, but it is not quite so clear why Mr. Z is in the dairy business.

Building Through Breeding.

There are several ways of improving a dairy herd. Elimination of low producers increases average production, decreases total production, and usually increases net profit. Better feeding of the cows we now have increases average production, increases total production, and may increase net profit. Use of better sires increases average production, increases total production, and always increases net profit.



Better Sires Increase Herd Production.

Six daughters of this bull averaged in one year 1,695 pounds more milk and 93 pounds more fat than their dams.

All dairy-herd improvement due to better breeding tends to increase profit to the producer and to decrease cost to the consumer. It is one of the ways by which the world may become richer without decreasing the prosperity of any individual in it. Therefore, as I see it, the breeders of good dairy cattle are among the world's greatest benefactors.

Well-formed, registered bulls from proved sires and advanced-registry dams are usually fit to head even high-producing dairy herds. When such bulls have proved sons and advanced-registry daughters, their value becomes exceedingly great because of the certainty that they will transmit to the offspring, in large measure, the high-producing qualities of the ancestors. So far as possible only such bulls should be chosen to head herds of selected, high-producing, registered dairy cattle. In ordinary dairy practice, however, the bull goes to the block before the production records of his daughters are available. In that way many excellent bulls are lost to the dairy business every year.

Dams and Daughters.

A few years ago a Wisconsin farmer sold his registered Holstein bull to the local butcher. At the time the bull was sold no records had been made by any of the daughters. Within one year 11 of the daughters freshened at the ages of 2 and 3. Records of milk and butterfat production were kept and to the farmer's astonishment the average milk production was 15,047 pounds and the average butterfat production 571 pounds.

Long before these records were available the bull was dead and his hide converted into leather. Because there were no records a $5,000 bull was sold for $50. The cow-testing association tests the dams and daughters; the bull association makes it possible to keep a bull until his daughters are tested. These associations would have saved that bull.

Every dairy herd should be carefully selected. Every carefully selected herd should be headed by a good bull. A good bull gets productive daughters. Such daughters greatly excel their dams. The dams may be selected scrubs, the daughters become productive grades, and the granddaughters high grades of very large production. Such intelligent, constructive breeding takes place in every well-managed cooperative bull association. The bull association combines low investment, light expense, and large profit.

A scrub dairy cow is almost worthless because she yields no profit. A scrub dairy bull is worse than worthless because he quickly drags the remainder of the herd down to his low level. In a year a scrub cow produced 146.8 pounds of butterfat. Her daughter, sired by a scrub bull, produced 126.3 pounds of butterfat, and the granddaughter, sired by the same scrub, produced 99.7 pounds of butterfat. California Gretel, a Toggenburg goat, produced almost as much.

"Looked Bad for Billy."

The registered Guernsey bull, Imp. Primrose's Billy of Waddington, was at the head of a grade Guernsey herd in the Leon Valley (Wisconsin) Cow-Testing Association. After he had been in the herd a couple of years it was decided to send him to the butcher to prevent inbreeding. "For a time," as the tester reported, "things looked bad for Billy, as he was headed straight for the block." Just in the nick of time six of his daughters furnished records at the ages of 2 and 3. Figured to maturity the average production of the daughters was 7,886 pounds of milk and 397 pounds of butterfat. The average production of their dams was 5,968 pounds of milk and 292 pounds of butterfat. The cow-testing association records saved Billy's life, and he is now at the head of a purebred Guernsey herd.

Looking Forward.

Ever since dairy records were first available it has been a common custom to rate the value of a dairy bull according to the records of his ancestors. That is all very well so far as it goes, but the thoughtful dairyman is just beginning to look in the opposite direction and to rate the value of a dairy bull according to the records of his daughters. In the past, bulls have been in great demand if they had proved sires and advanced-registry dams. Such bulls may or may not have the power to transmit the high-producing qualities of their ancestors. In future times a bull will be in great demand if he has proved sons and advanced-registry daughters, especially if the daughters have records much above the records of high-producing dams.

We have made considerable progress in dairying by selecting for breeding purposes the descendants of high producers, but we can never make the most rapid progress until we begin to look forward as well as backward. The records of the first ten daughters determine with a high degree of certainty the true value of a dairy bull, and it is doubtful whether any bull, regardless of his breeding, should head any well-bred herd until a number of his daughters have been tested and their records compared with the records of their dams. When all dairy bulls are required to pass through a probationary period before they are allowed to head a dairy herd, when only proved sires are allowed to become the sires of many daughters, and when the best of these sires are used to their full capacity, then, and not until then, may we look for a tremendous advance in the economical production of our dairy herds.

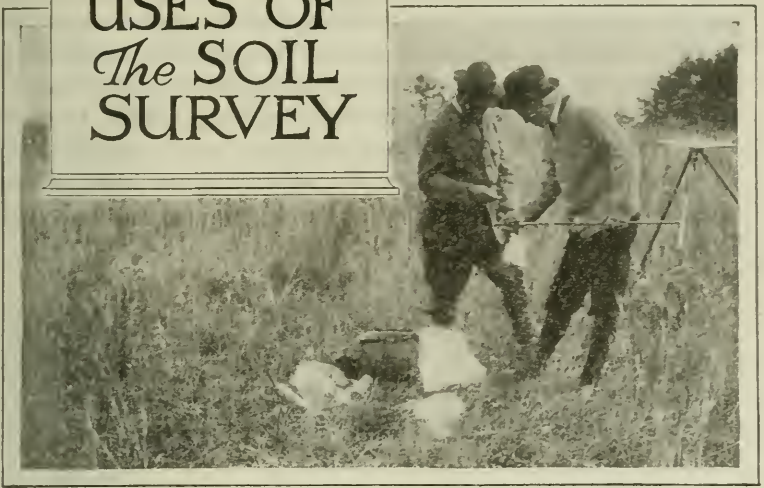
We now have the machinery to carry out this plan. The cow-testing association, at little cost, keeps the records of dams and daughters, and the bull association makes it possible to keep a good dairy sire for ten or twelve years, or as long as he is fit for service without the dangers of inbreeding.

Profits Made Certain.

Of all the enterprises of the farm none lends itself more readily than dairying to the keeping of records, and there is no other farm enterprise in which the lack of records is more fatal to success. With the Babcock test, the milk scales, the feed scales, and a working knowledge of the multiplication table, dairying need never be conducted at a loss.

The cow that produces enough to buy her feed and pay a satisfactory profit is the kind to be kept if we are dairying for dollars. Such a cow makes the dairy business interesting, adds to the profits of farming, and lifts agriculture to high and still higher levels. May her tribe increase.

USES OF The SOIL SURVEY



By Charles H. Seaton,
Editor, Bureau of Soils.

TOWARD the close of the nineteenth century the Department of Agriculture embarked upon the serious study of the soils of the country. Up to that time work upon this subject had been sporadic and general, and the results of a character ill suited for use as a basis either for scientific research or for application to the practical needs of agriculture.

It was proposed now to change all this—to proceed in a thorough, systematic way to map, name, and classify the different soils of the country; to show their extent and their relation to one another, to existing agriculture, and to the possibilities of agricultural changes and extension. It was proposed also to investigate, in properly equipped laboratories, the physical and chemical properties of soils.

Upon this undertaking the Division, now the Bureau, of Soils embarked. The sea it was to sail was uncharted; none before had gone far upon it; there was little or no precedent to follow.

But there is no room here to dwell upon the interesting period of constructive development—the period when methods were devised and tested by experiment, when system was evolved and perfected. The space can better be used to describe briefly the work as it is carried on at present, to state broadly the things achieved in nearly a quarter century of consistent endeavor, the various practical applications to which the results lend themselves, and the ideals toward which it is believed agriculture will move more rapidly and more certainly when the facts gathered have been thoroughly digested and made an integral part of agricultural knowledge.

Soil Maps.

A number of Government agencies make maps. The United States Geological Survey has for years been engaged in surveys, principally of mineralized sections of the country, and has published many maps intended primarily for the mining industry and for the engineer. The Coast and Geodetic Survey has charted the coast lines for the benefit of mariners. The General Land Office has mapped the public domain in its work of patenting homestead and other Federal land grants. The soil maps issued by the Department of Agriculture conflict with none of these, being designed for a distinct purpose—the furtherance of agriculture.

In the surveying of soils use is made of the maps issued by other branches of the Government whenever possible, so that there will not be duplication of effort and needless expenditure of funds, but where no suitable Government, State, or privately published map is in existence the soil surveyors construct base maps as well as plot the soils. The base maps so prepared are placed at the disposal of the other mapmaking agencies and are the means of saving much time and effort to these other branches of the Government service.

A soil map thus consists of a base, showing the salient natural features of an area, and the towns, houses, roads, railroads, and other artificial features, upon which base are outlined and colored the various areas of the different types of soil. Ordinarily the survey covers a single county. A surveying party, consisting usually of two men, visits every part of the chosen area, tracing and locating the soil boundaries, taking samples of the soil and of the subsoil to a depth of 3 feet in the East and to 6 feet in the far West, and identifying the various types of soil, so far as may be done from field examination. This work is revised by inspectors, who visit the areas from time to time, and is finally passed upon by a committee of correlation, who make certain that each soil is properly named, so that the same soils in different parts of the country shall not bear different names, and thus defeat the object of classification.

There are in the United States 3,043 counties. Detailed surveys have been completed in 926 counties.[1] The total extent of these surveys, 547,733 square miles, is equal to the combined areas of Great Britain and Ireland, France, and the German Empire before the World War. In addition to the area surveyed in detail, about an equal extent of country has been covered by reconnoissance maps, the two together representing one-third the area of continental United States, and very much more than one-third of the arable lands of the Nation.

Thus there has been accumulated by the department in a quarter century a vast store of facts concerning our soil resources—the number of different soils, their location, distribution, and extent, their origin, and their physical characteristics in both surface and subsoil. Concurrent with the compilation of such facts has been the collection of data relating to the use of soils, to productiveness, to soil adaptation, or the peculiar fitness of soils of certain types to certain crops or to certain definite crop qualities.

While admitting the value of accumulated knowledge on whatever subject, the reader will want to know in just what ways the country is benefiting from the results of soil work, and what good may be expected to flow from it in the future. Some of the benefits are obvious, direct, and immediate; some are less obvious and indirect, though of greater importance.

Buying Farm Lands.

Among the more obvious ways in which the results of the soil survey are of practical value is their use by corporations, colonization societies, and individuals in locating and purchasing farm lands. It may be that a definite type of agriculture has been determined upon. Where can lands

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[1] A few areas, each covering only a part of a county or parts of several counties, have been included in this count.

best suited to that type be found? Upon what soils can rice growing be safely and profitably undertaken, or the production of tobacco of the various kinds be followed, or the raising of hogs with alfalfa pasture as a feature in their management be engaged in? Perhaps you would establish a commercial peach orchard in Georgia, embark upon the growing of long-staple cotton in South Carolina, or specialize in the production of asparagus, peppers, tomatoes for canning, or lima beans in New Jersey. The results of the soil survey will help you to select suitable land. Or when farmer John Doe decides to sell his fat and high-priced acres in the corn belt and reinvest in cheaper lands in a milder climate, he will find a soil survey report a very helpful thing to carry with him on his inspection trip. The records of the department show a steadily increasing number of persons using its soil publications in this way. Anything that aids in a safe and sane movement back to the farm in these days when the shift toward the city preponderates stands in a position to benefit the Nation.

Lands and Loans.

The basis for the evaluation of farm lands and the foundation of the wealth of agricultural communities is the productiveness of the soil. It is therefore not surprising that concerns interested in the placing of farm loans, in the handling of rural mortgage securities, or in the financing of industrial enterprises depending upon the soil for their raw materials should find in the information afforded by the soil-survey publications a valuable aid to their business. A distant banker may find it well worth while to substantiate the favorable opinion of his local agent as to lending $10,000 to Mr. B. with his farm situated 1 mile from Beeville as security. A glance at a soil map may do this, or it may not—depending upon what it shows. Mr. B's farm may be composed entirely of the Hagerstown silt loam, one of the very best soils in the East, with a value in normal times running from $100 to $300 an acre, which, with other known facts, would make the security ample, or his farm may be composed of the Norfolk sand and undrained Portsmouth soils in an indeveloped part of the Coastal Plain, in which case, even if there were 1,500 acres, the local agent's favorable report would require, to say the least, careful explanation. This illustration will suffice to indicate how the facts gathered by the soil survey are of value to financial business.

A Basis for Agricultural Advancement.

These are a few of the more obvious ways in which use is made of the facts gathered by the soil survey. The value of such use, while large and of growing importance, is overshadowed by the present and prospective value of a less obvious and, as regards the ultimate beneficiaries—the farmer and the general public—less direct use. This is the use of the scientific data concerning soils by scientific workers in all the varied lines of endeavor looking to the improvement of agriculture.

At the time the Government began the soil survey the known facts relating to the country's soils were for the most part general, and the accumulated soil knowledge not only meager but a jumbled and chaotic mass, without system or the value which orderly arrangement gives. Take the question of soil texture, for instance. The differentiation of soils on the basis of their mechanical composition was woefully incomplete, depended upon empirical methods, and thus varied widely with the judgment of the individual. Soils were sandy soils, loams, or clays, and what constituted one or another class merely a matter of opinion. Compare this with the present classification of soils on the basis of texture into 12 distinct classes, scientifically determined, and uniformly applied to soils throughout the country, so that a fine sand in Maine is the same as a fine sand in Oregon, and a silt loam is a silt loam, and a clay a clay, no matter in what part of the country it may occur.

Take the question of the extent and relative importance of soils. No one at the time referred to knew which were the great soils of the country. Many knew where wide areas of productive lands occurred, where the production of the great staple crops was concentrated, but until the soils had been identified and measured ideas as to their rank and importance were hazy in the extreme.

This is only a small part of the story, but enough to indicate the change that has taken place in our knowledge of the soils. It needs no argument to convince one that the influence of the standardization of soil types upon crop experiments and the application of the results of such experiments is fundamental and of the greatest moment.

In carrying on the soil survey the department is working in cooperation with the experiment stations or other public agencies in more than 20 States. This cooperation is most intimate, the several States contributing in men and money equally with the Federal Government. In this way the results of the work are brought home to the leading agricultural investigators in all parts of the country and are becoming a part of the equipment of the most powerful agency existing in the Nation for the advancement of agriculture.

Time was when it was considered sufficient to have a central experiment station in a State, there to carry on variety, fertilizer, and cultural tests on one type, or at least two or three types, of soil, and to advise farmers in all parts of the State, located on widely different types of soils, on the basis of the results achieved on the one type at the central station. The general inadequacy of this system is now recognized by nearly all, if not all, the station workers, and more and more of the stations are providing in one way or another for the tying of results to the important soils of the States.

Take one instance, that of North Carolina. In this State test farms have been established on the more important soils in different parts of its confines, and a farmer on a certain soil is advised on the basis of results of tests on that soil. A separate edition of the soil survey report also is issued, in which experimental results on the several soils of a county are added to the text of the Federal report. Other States are following up the soil survey in various ways and correlating the results of their work with soil conditions. This refinement is made possible by the knowledge gained in the soil survey. It and other refinements to follow make for increased production, greater profits to the farmer, and cheaper food and clothing for the consumer.

Soil as a Factor in Crop Production.

One of the results of the soil survey has been to emphasize the importance of the soil as a factor in crop production, to immeasurably raise this importance in the estimation of those who study the problems in which the soil enters. It has long been recognized in a general way that definite relationships exist between the character of the soil and the yield and quality of its plant products, and this has been substantiated by much concrete evidence. Standarization of soil characters and much finer distinctions between soils than were possible before have shown that these relationships are much more delicate than would be supposed. Thus the bright tobacco produced on the Durham fine sandy loam is superior to that from the Norfolk fine sandy loam, for the purpose intended, the manufacture of pipe tobaccos and cigarettes. Yet these soils are texturally the same, occur in the same districts, and therefore under similar climatic influences, and are similarly well drained. Again, Wilder[2] found that in the same district in New York certain soils would produce a green Rhode Island Greening and certain other soils a yellow Rhode Island Greening. The two types of Greening finding favor in different markets, it would be clearly of advantage to the orchardist to know beforehand what soil to select in setting out his trees. Wilder also found that the best soils for the Greening were not the best soils for the Baldwin or certain other varieties, though in the common practice of the orchardists such distinction in their plantings was exceedingly rare, and naturally, for the facts were not known to them. Instances of this close relation between soil type and quality of product could be multiplied almost without end; but the object is attained if the instances cited carry the suggestion of an almost unlimited field for future use of the facts gathered and to be gathered by the survey and scientific study of the soil—the suggestion that finer and finer distinction may be made in the practical use of soils, in the selection of crops, in the breeding of new crop varieties to fit important soils, and in the adjustment of our basic agricultural industries, as well as special industries, to the soils on which they are most certain best to flourish.

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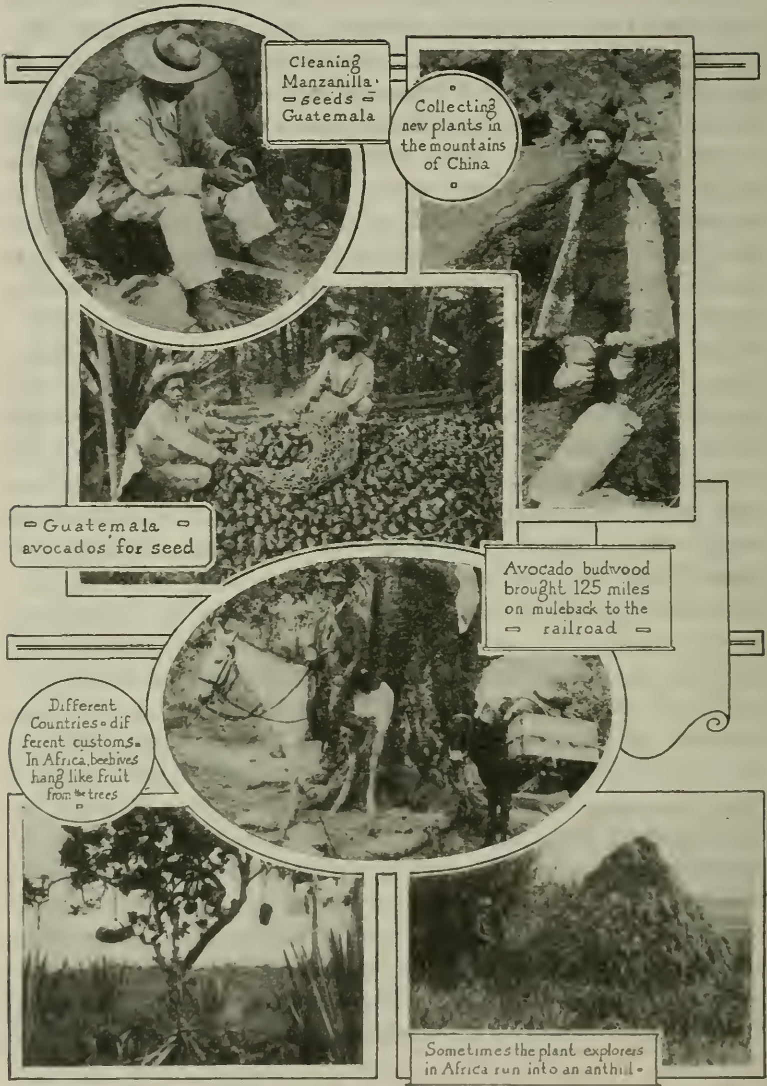
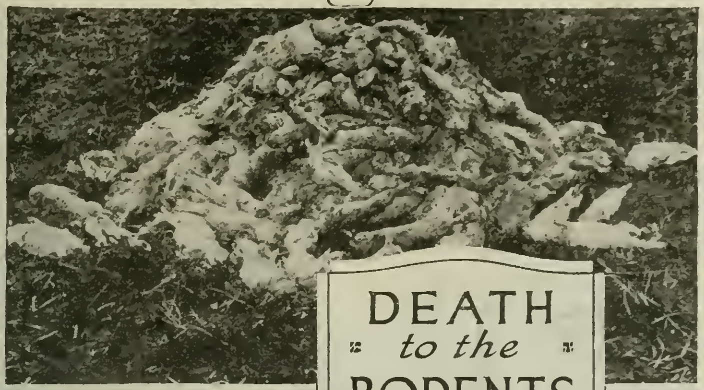
[2] Henry J. Wilder in an unpublished manuscript, The Apple Soils of New York.



Department of Agriculture Explorers scour the world for new plants and seeds



DEATH to the RODENTS

By W. B. Bell,
Assistant Biologist in Economic Investigations.
Bureau of Biological Survey.

TO ELIMINATE a crop-production loss of $500,000,000 a year, due to rodents, looks like a staggering undertaking. When a leak is detected in a corporation, mill, or factory and a means of prevention is found, it is possible to issue orders putting improved practice into effect forthwith. Not so in the case of losses caused by rodent pests: you can not order the rodents to stop eating.

The magnitude of the task is measured by the length and breadth of the whole of the United States, and its execution requires not only action by Federal and State officials, but the voluntary cooperation of hundreds of thousands of people who must be enlisted in the movement. A great educational campaign must be conducted to fix public attention upon the need, to give assurance as to the practical character of the methods to be employed, and to obtain concerted action by private, State, and Federal agencies. Plans and means of organization must be provided, trained and experienced leadership secured, cooperation of great numbers of people effected, legislation enacted, financial support furnished, and special supplies procured and laid down at the point of use.

The actual carrying forward of this work has afforded a fine instance not only of willingness to cooperate but of cooperation put into effective, harmonious, and widely correlated action on a large scale, involving many thousands of farmers and stockmen, their organizations, and county, State, and Federal officials.

Some idea of the seriousness of the losses suffered annually from the native rodents, including prairie dogs, ground

B19705

Results of Prairie-Dog Activities.

A close-up view showing detail of work of prairie dogs on a heavily infested area. All valuable forage grasses, including their root systems, had been completely destroyed, leaving only a few scattering clumps of weeds and wire grass. Not less than 100,000,000 acres of range and agricultural lands are infested by prairie dogs, these animals selecting the most productive valleys and bench lands for their devastating activities. After poison treatment, 55 dead prairie dogs were counted on the area in the illustration.

squirrels, pocket gophers, and jack rabbits, may be obtained from the following estimates submitted during the fiscal year 1917 by certain State directors of agricultural extension: Montana, \$15,000,000 to \$20,000,000; North Dakota, \$6,000,000 to \$9,000,000; Kansas, \$12,000,000; Colorado, \$2,000,000; California, \$20,000,000; Wyoming, 15 per cent of all crops; Nevada, 10 to 15 per cent of all crops, or \$1,000,000; New Mexico, \$1,200,000 loss to crops and double this amount to range. In a single county of Virginia, losses of orchard trees from depredations of pine mice from 1915 to 1917 were estimated at not less than $200,000. Similarly heavy losses were disclosed in other States as attention was directed to these direct causes of decreased production. It is estimated that native rodents cause a loss of $150,000,000 a year in the United States in cultivated crops and a similar loss in forage on the pasture ranges, making a total loss of $300,000,000 a year from this source.

B20742; B20743

Effect of Prairie Dogs on Range Production.

Upper view, an area which has not yet been invaded by prairie dogs, showing the natural stand of grama grass, one of the most valuable range forage plants. Lower view, from photograph taken at the same time of a near-by area invaded by prairie dogs. Here these pests have completely destroyed all valuable forage grasses, reducing the stock-carrying capacity to zero.

Eating Up the Margin of Profit.

For many years farmers and stockmen, in numerous instances driven to the verge of desperation by constantly recurring losses, endeavored to clear their holdings of rodent pests, only to find their methods ineffective or their lands constantly reinfested by animals coming in from adjacent Government lands or from those of their less thrifty and energetic neighbors. Large sums were expended by States, counties, and townships for bounties, only to disclose that, while their treasuries were greatly depleted, the animal pests persisted in practically undiminished numbers. Manufacturers and dealers in commercial poison preparations were reaping a constantly increasing harvest through the sale of their products, while the farmer saw his crop returns constantly reduced by the inroads of rodent pests.

The Biological Survey received many urgent appeals for help from the far-western States, the cry being that if the rodents could not be controlled the people would have to abandon their ranches. In many instances it was apparent that the portion of the crop eaten by the rodents represented the difference between a comfortable profit and a distinct loss on the year's enterprise. A profit of 10 per cent on a given business turnover is usually accounted a fair return. On the farms of western States prairie dogs, ground squirrels, pocket gophers, jack rabbits, and similar rodent pests were commonly cutting down the crop yields 10, 20, and 30 per cent, and in many instances were destroying the entire stand.

When farmers became aware of the extent of these losses they were eager to learn how to obtain permanent relief. When Department specialists and county agents had gone out into the grain fields and demonstrated beyond question the amount of loss involved, by measuring off the area of a given crop and the part that had been destroyed by rodents, the farmers began to see the importance of having this margin placed on the credit side of the farm account book or in their bank, instead of having it consumed for the immediate requirements of these myriads of small raiders or stored as fat for their subsistence while indulging in their long hibernation sleep.

Destructive Activity of Prairie Dogs on Cultivated Crops.

At left, field of oats, showing normal production at harvest time; at right, a contrasting view of a portion of the same field invaded by prairie dogs. Where the prairie dogs have attacked the crop, nothing is left to harvest. Corn, wheat, oats, rye, barley, feterita, and alfalfa are among the valuable grain and hay crops of the United States which prairie dogs, ground squirrels, pocket gophers, jack rabbits, and similar rodent pests destroy to the extent of $150,000,000 annually.

As long as stockmen could merely move on to fresh pastures with their flocks and herds and there was abundance for all comers, there was little concern over the great stretches of fertile range lands denuded and made unproductive by the hosts of rodents feeding undisturbed upon them. With increasing settlement of the country, larger numbers of live stock, keener competition for the more productive ranges, and reduced areas of free Government pasture lands, stockmen began to cast about for means of maintaining their live-stock production. When it became apparent that the carrying capacity of their pasture ranges was being reduced from 10 to 50 per cent or more by the prairie dogs and ground squirrels, which occupied the most fertile and favorably situated valleys and bench lands, denuding them of grass and rendering them useless for pasturage purposes, it became evident that eradication of these animals was the most practical way of providing additional forage to maintain and increase flocks and herds.

Fortunately, positive evidence that the carrying capacity of pasture ranges could be greatly increased by this means was at hand. Large areas of Government lands, cleared of rodents by Biological Survey field parties, had shown quick recovery of forage grasses and a marked increase in the number of cattle and sheep that could be carried on them. Smaller demonstration plots, which had been established under similar conditions to illustrate the difference in productivity between infested and cleared areas, showed grass knee high on the land where rodents had been destroyed and reinvasion prevented, as contrasted with grass cropped close to the ground on land immediately adjoining, where the rodents had been left in their usual numbers.

Typical Grass Specimens from Experimental Plots.

A, The best samples found in the inclosure where the prairie-dog population was normal. *B*, Sample of normal production in adjacent plot, where prairie dogs had been eradicated and reinfestation prevented.

Going After the Rodents.

Up to and including the year 1916 the Biological Survey had worked largely on field investigation of damage caused by prairie dogs, ground squirrels, pocket gophers, jack rabbits, field mice, and related pests, together with study and experimentation to determine effective methods for their control or eradication in localities where they were proving seriously destructive of crops and range grasses.

Field-party operations against prairie dogs had been conducted on 15 national forests in Arizona, Colorado, Montana, New Mexico, Utah, and Oklahoma, on the Crow In-

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Biological Survey Field Party Distributing Poisoned Grain to Destroy Rodent Pests.

Over 132,000 men working afoot and on horseback in cooperative campaigns distributed 1,610 tons of poisoned grain on more than 32,000,000 acres of range and farm land during the year 1920. The resulting destruction of prairie dogs and ground squirrels effected a saving of $11,000,000.

dian Reservation in Montana, the Fort Sill Military Reservation in Oklahoma, and on considerable areas of public lands in Wyoming. Similar operations against ground squirrels had been undertaken on the California and Sequoia National Forests, and other forests in Modoc, Monterey, Kern, and Santa Barbara Counties, Calif.; on a small area in the vicinity of Sopris, Colo.; and on the Fort Totten Indian Reservation, N. Dak. A small amount of work had been done against pocket gophers on the Sequoia and Tahoe National Forests, Calif.; the Nebraska National Forest, Nebr.; and the Ochoco National Forest, Oreg. Some demonstrations had also been given to show farmers and stockmen how to protect crops and hay from destruction by jack rabbits.

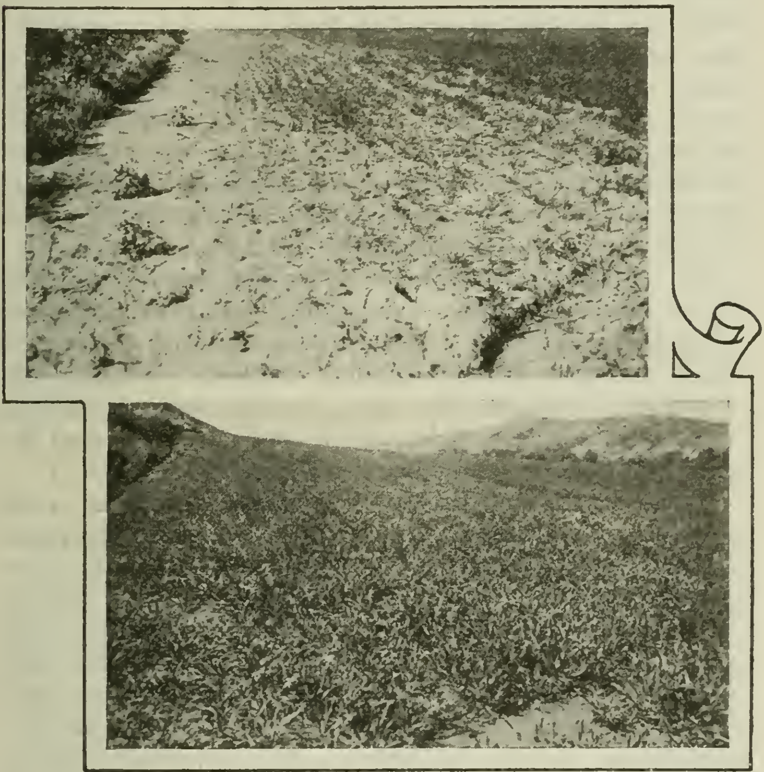
During 1916, 1,356,429 acres of Government lands were given original treatment for the eradication of prairie dogs, and 164,755 acres, previously poisoned, were given a second treatment to complete the work; 208,950 acres were treated for the destruction of ground squirrels; and 7,770 acres for the extermination of pocket gophers. Some demonstration work also was done to enable farmers and ranchmen to apply on their own lands the methods which the Biological Survey

B19712

Results of Poison Properly Prepared and Distributed.

Pile of 1,872 prairie dogs, picked up on 320 acres after poison was distributed by men working according to directions of the Biological Survey. A large percentage of animals killed were not collected, as they entered the burrows before the poison could act. The grass required to feed these animals is sufficient for the maintenance of several head of cattle or sheep. Results such as this have convinced stockmen and farmers that this work is practical and worth while as a means of increasing production.

had found most effective in eradicating rodent pests on Federal lands. Demonstrations were given and campaigns organized to combat jack rabbits in infested farming communities of southern Idaho, central and eastern Oregon, southwestern Utah, northern Nevada, western Texas, and in smaller areas in California. Extermination of rodents that destroy seeds and nursery stock on areas being reforested had been completed on the Black Hills National Forest, S. Dak., and the Florida National Forest, Fla. Experiments to devise eradication methods had been conducted on the above planting areas and on the Converse Experiment Station of California. Improved methods for controlling pine mice, wood rats, and other seed-eating rodents also were developed.



B18593; B18598

Ground-Squirrel Work in Grain Fields.

The upper view is of a field of oats, showing along the border the usual results of ground-squirrel activity in destroying the growing crop before eradication work was undertaken. A loss of 10 to 30 per cent of a field of grain occurred commonly before the cooperative campaigns were launched. The lower view is from a photograph of a field adjoining, where damage was prevented by poisoning the ground squirrels on the planted area and on adjacent fields of pasture land. Here it was possible to harvest a full crop from the entire area planted.

Cooperation.

During the spring of 1916 the extended poisoning campaigns undertaken in North Dakota against ground squirrels—locally known as "gophers"—had the cooperation of the experiment station and extension service of the agricultural college. The operations included demonstration of the most effective methods of destroying these pests in farming communities and the organization of systematic township and county campaigns. These animals were reported as causing crop losses aggregating from six to nine million dollars annually in the State. In this campaign the then enormous quantity of five-eighths of a ton of strychnine was used. This was prepared and applied to grain bait under supervision of Department of Agriculture and State experts according to methods determined through extended field experiments previously conducted by the Biological Survey and the State experiment station.

This work, organized in seven counties, was the beginning of systematic cooperative campaigns to clear of rodent pests great areas, involving Federal, State, and private lands, in which the costs were paid by the respective owners. The organized movement has gone forward with remarkably rapid strides because it has met a very important need in a practical, effective, and economical way.

These campaigns demonstrated that losses from rodent pests not only constitute an entirely unnecessary drain upon the productive capacity of the farms and stock ranges, but that they may be permanently eliminated at a cost which is but a small fraction of the damage occasioned during a single year. Where the expense for labor and poisoned materials is included, the cost of this work usually ranges between 4 and 10 cents an acre, depending on the kinds of animals and their abundance. Where the farmers and stockmen utilize the services of their regular farm and ranch help in distributing the poisoned grain on their land no increased cost of operation is involved except the cash outlay for poison supplies, which usually amounts to only 1 or 2 cents an acre.

By 1917 the time was ripe for correlating all rodent eradication activities in accordance with a unified but comprehensive plan. Work under the plan outlined by the Department of Agriculture for the organization of cooperative campaigns for the control of ground squirrels, prairie dogs, and jack rabbits (Yearbook Separate No. 724, 1917) was already progressing favorably in several States, and requests were received from officials and farmers to extend the service to include other States. Added stimulus was given the movement by the world appeal to the United States at this time for cereal and meat products. Cutting off losses of grain crops due to rodent depredations, thus making possible the harvesting of the entire crop, was a most direct, practical, and economical way of increasing the available supply of grain. Farmers were prompt to recognize this and to join in the movement, as its effectiveness and value were demonstrated by Department specialists and county agents. Stockmen were quick also to see that the saving of alfalfa and range grasses from being eaten and uprooted by rodents afforded an immediate means of carrying and finishing for market greater numbers of cattle and sheep, thus increasing the urgently needed supply of meat, hides, and wool. With the enthusiastic and hearty cooperation of extension directors, county agents, State officials, farmers, and stockmen, the work has been extended until now it embraces thoroughly organized aggressive campaigns in 16 western States.

Four Tons of Strychnine for Prairie Dogs and Ground Squirrels.

The extent of operations at the present time is indicated by the fact that in cooperative undertakings during the past year Biological Survey field men have guided farmers and stockmen in the destruction of prairie dogs and ground squirrels on over 18,000,000 acres of farm and range lands, and have re-treated 14,672,000 acres in follow-up work to complete eradication. The Survey parties, aided by labor contributed by cooperating farmers, have destroyed most of the prairie dogs and ground squirrels on approximately 1,000,000 acres of the public domain. More than 4,500,000 acres of public lands have already been largely freed from prairie dogs, and this work at the present time is closely correlated with the cooperative campaigns on private lands. Over 132,000 farmers and stockmen joined in this work, and 1,610 tons of poisoned grain were distributed on infested lands. This required the purchase, preparation, and use of over 4 tons of strychnine.

The estimated saving in crops and range grasses, based largely on statements of farmers and stockmen themselves, amounts to more than $11,000,000 for the past season. Farmers report in many cases a crop return of $15 to $20 for each dollar invested in the work, and a very marked increase in the stock-carrying capacity of the ranges. This may be illustrated by a recent statement that on 90,000 acres cleared of prairie dogs in Arizona, increased forage has been raised sufficient to feed an extra head of cattle to every 20 acres, or from 20 to 30 head on each section of land. The forester in charge of the Santa Rita Range Reserve, in New Mexico, reports that 2,305 acres, previously of little value because practically all of the forage was consumed by prairie dogs, have been partially restored for grazing purposes, and that when the work is completed this range will carry 75 to 100 additional stock annually.

Acreage treated with poisoned baits for the eradication of prairie dogs and ground squirrels in Federal and cooperative campaigns, by States and fiscal years.[1]

State.	Acreage treated.				
	1916	1917	1918	1919	1920
Arizona	278,540	384,980	263,920	120,710	427,048
California	184,960	170,953	3,332,900	3,232,224	1,070,814
Colorado	40,904	41,642	159,110	795,433	769,480
Idaho			277,751	737,433	240,252
Kansas					21,325
Montana	73,576	82,755	3,681,673	4,541,400	6,926,944
Nebraska					75,275
Nevada			85,000		161,231
New Mexico	177,010	95,435	1,167,094	951,618	607,156
North Dakota	4,960,160	4,537,600	5,487,580	4,000,000	5,991,275
Oklahoma				8,600	80,543
Oregon	5,390	13,000	717,600	724,000	317,850
South Dakota	52,371			600,000	1,310,200
Texas	107,293		3,000		
Utah			4,255	317,960	589,756
Washington				303,200	498,644
Wyoming	340,790	442,647	717,189	404,628	135,200
Total	6,220,991	5,769,012	15,897,072	17,037,206	19,222,993

[1] The year in each case ends with June 30.

Pocket Gophers Take the Bait.

Success has attended similar lines of campaign for the destruction of pocket gophers, chiefly in Kansas, Nebraska, Idaho, Oregon, New Mexico, and Arizona. Reports have been received from many farmers that it was possible to

Pocket-Gopher Mounds in Cultivated Field.

While burrowing underground, pocket gophers cut off the roots of alfalfa and other growing crops and of orchard trees, and pile up great mounds of dirt on the surface. These mounds cover up and destroy much of the crop, damage machinery used in harvesting, and interfere with its efficient operation.

destroy as many as 95 per cent of these animals through a single application of the poisoned bait. Pocket gophers occur in all States west of the Mississippi River and are particularly destructive to alfalfa, grazing lands, hay meadows, and root crops. A stand of alfalfa is often entirely ruined through the cutting off of the main branches of the root system. The quantity of hay that can be harvested is reduced both by this depletion of the stand and through being buried by the great mounds of dirt which are thrown up by pocket gophers. These mounds also interfere seriously with the operation of the harvesting machinery.

In addition to the direct damage caused by pocket gophers, their burrows frequently serve as an outlet for water from irrigation ditches. The flow of water through these small openings enlarges them, and breaks occur that result in serious loss of water and the flooding and destruction of crops. Such washouts also entail large expenditures in repairs. Burrows distributed over the irrigated areas also admit water when irrigation is in progress, frequently resulting in the washing of deep gullies on sloping land and also interfering seriously with the proper distribution of the available water supply. A striking instance of the breaking of a canal bank, due to a pocket-gopher burrow, occurred in the Farmers' Cooperative Canal Co. project of Canyon

County, Idaho, in May, 1919. The canal is 26 miles long and draws 18,000 inches of water, which is used in supplying about 30,000 acres of land. To repair this break cost the company $5,000, and during the interval before repairs could be completed drought caused a loss of 25 per cent of the hay crop, for the growth of which the irrigation water was intended. Important campaigns are now in progress in irrigated sections with a view to overcoming such losses.

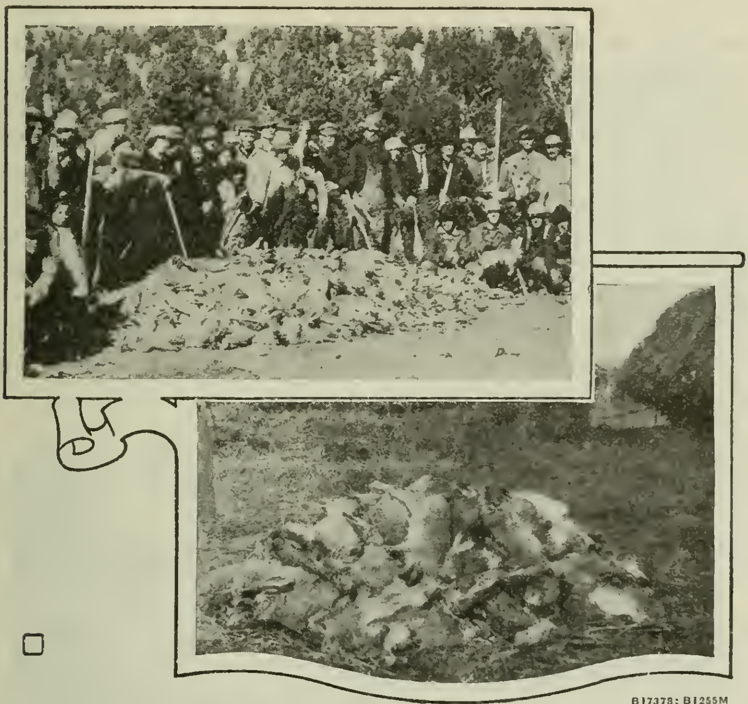
B1705M

A Costly Pocket-Gopher Burrow.

Break in bank of irrigation canal caused by pocket gopher. Besides a bill of $5,000 for repairs, 25 per cent of the hay crop on 30,000 acres was lost, owing to lack of water, occasioned by the break, at a critical time during the growing period.

Getting Jack Rabbits With Poison and Drives.

Where jack rabbits are abundant they are responsible for heavy losses of farm crops and range grasses. Many instances have occurred where entire fields of grain were cut down and absolutely destroyed by these animals, and farmers stated that it would be necessary to abandon their farms unless the ravages could be stopped. During the summer jack rabbits frequently gather in great numbers in grain and alfalfa fields. Under such conditions they may completely devastate great areas of growing grain or eat out the crowns of the young alfalfa, thus preventing its proper growth. During the winter season they congregate about stacks of hay and grain, feeding upon supplies intended for the subsistence of live stock. Their inroads are so serious that a stack is frequently entirely undermined, topples over, and becomes practically a complete loss. They oftentimes seri-



B17378; B1255M

Poison and Drives Get Results Against Jack Rabbits.

Farmers and stockmen, tired of seeing growing crops and stacked hay destroyed by jack rabbits, appealed to their Government for assistance. The systematic distribution of poison and the conduct of organized drives have accounted for many thousands of jack rabbits and have afforded practically complete protection from their depredations in localities where the work was undertaken.

ously interfere with the introduction of new and profitable crops, as in the case of lettuce and long-staple cotton in Arizona, and peanuts in Oklahoma, and, by gnawing the bark from the trees, seriously damage orchards.

In Arizona, Idaho, Nevada, Oregon, Utah, and Washington, campaigns for the control of jack rabbits, organized on a considerable scale, were conducted under the leadership of Biological Survey field representatives in cooperation with local agencies. The animals were destroyed through the use of poison and also by driving them between converging fences into inclosures where they were killed. In Idaho a total of 40,000 rabbits were killed in Minidoka County; and an average of 400 rabbits for each ounce of strychnine used was reported in Lincoln County. Two farmers in Gooding County reported killing 1,000 jack rabbits with each ounce of strychnine. The organized drive also accounted for great numbers. Seven drives conducted in Bingham County, Idaho, netted 15,728 rabbits. Other notable kills through county drives in the State were 5,500 rabbits in Gooding County, 17,800 in Jerome, 20,000 in Lincoln, and 19,000 in Minidoka. One drive in Washington County resulted in killing 10,000 animals.

Practically complete protection of crops was effected during the season of 1920, according to reports received from

B1706M

Damage to Orchards by Rodents.

Roots of orchard trees are cut off and trees killed by pocket gophers and pine mice; the bark is gnawed from the trunk by jack rabbits, cottontails, and meadow mice; and nuts and fruits are frequently eaten and destroyed by ground squirrels, two of which are here pictured, poisoned at their burrow at the root of an orchard tree.

farmers in localities where these campaigns were conducted. Owing to the high price prevailing for skins, a large number from the killed animals were cured and marketed. In many instances the carcasses of rabbits killed in drives were also collected and shipped to city markets to be disposed of for human consumption. In other cases they were utilized as feed for poultry and swine.

B1617M

Some "Good" Rats from a City Market.

Rats are notorious destroyers of food products in all stages, from the planting of the fields to harvest, storage, or use on the farm, in transit to market, at terminal elevators, mills, and warehouses, at the distributing points, and in the pantry of the ultimate purchaser. They not only destroy but contaminate and pollute food products with filth and disease-producing organisms. The rat has been designated as "the most destructive animal in the world" and it fully deserves this invidious distinction. It has no redeeming traits to compensate for its disgusting depredations. Starvation, poison, trap, and exclusion should be its portion everywhere.

Thirty Thousand Rat Tails.

The Biological Survey has developed effective, practical, and economical measures for the control of house rats and mice, introduced pests which annually destroy $200,000,000 worth of crops and stored products in the United States. This sum does not take into account the large amounts expended in efforts to combat them. Recommended methods of operating against these pests are by means of poisoning and trapping and the rat-proof construction of buildings. An extended educational campaign has been conducted during the past four years in order to acquaint the public with the serious drain on the Nation's food resources through depredations of house rats. Demonstrations have been given of methods of poisoning and trapping the animals, and plans for community organization against them have been presented and put into operation at many points. As a result, many State officials, municipal organizations, and public-spirited citizens have taken up the work of organizing campaigns, and great numbers of the rodents have been destroyed. A campaign recently waged against rats in a small town in Virginia resulted in 30,000 tails being turned in as evidence of its success. Substantial progress has also been made throughout the country in rat-proofing existing buildings where food and feed products are stored and in introducing rat-proof features into buildings now being planned and constructed. The enormous movement required for an effective fight against these pests, which are both a source of economic loss and a menace to health, appears to be gradually taking shape and steadily but surely getting under way.

Financial Support.

The most convincing evidence that campaigns against rodent pests are getting the desired results lies in the fact that when the Biological Survey began the work no funds were being supplied by the States to help, except for an appropriation of $3,500 in North Dakota. During the fiscal year 1920 funds expended by cooperating State and county organizations and by individuals amounted to $849,000. Present prospects indicate that this will be materially increased from year to year, and the operations are being pressed with unabated vigor and enthusiasm. Most of the States where campaigns are in progress have already enacted legislation making provision for financing and organizing the work in cooperation with the Biological Survey.

Putting WOOD WASTE *to* WORK

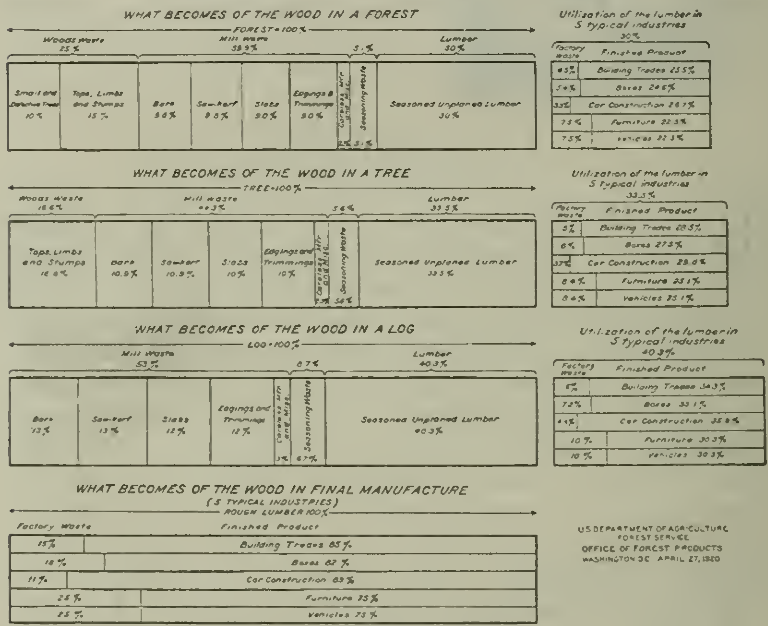
By Samuel T. Dana,
Forest Economist, Forest Service.

BIG BUSINESS is not in the habit of opening its pocketbook to demonstrate its appreciation of Government activities. The exception that proves the rule occurred at Madison, Wis., in July, 1920, when lumbermen, timber manufacturers, and wood users generally assembled from near and far to celebrate 10 years of service by the Forest Products Laboratory, established in 1910 by the Forest Service in cooperation with the University of Wisconsin. For the first time in history a group of industries, on their own initiative and at their own expense, arranged an elaborate meeting for the sole purpose of indorsing the scientific work of a Government institution. Why? Because of the service that institution is rendering through investigations aimed at making the most of our wood supply.

The End of the Trail.

General recognition of the need for such investigations is very recent. Thirty, twenty, even ten, years ago they would have been scoffed at in many, perhaps most, parts of the very industries now urging their expansion. So long as our timber supplies were regarded as inexhaustible, interest in their most efficient utilization was decidedly feeble. It is not human nature to make the most of the things we have in abundance. "Easy come, easy go," is true alike of individuals and of nations.

Prophets of a day of reckoning have been crying in the wilderness for many years. To-day the increased prices and growing scarcity of forest products resulting from the steady depletion of one forest region after another are driving home their message. The pinch on our pocketbooks is at last beginning to convince even those not versed in higher mathematics that it is a physical impossibility to continue indefinitely removing from the forest three or four times the material grown. Year after year we have cut, burned,

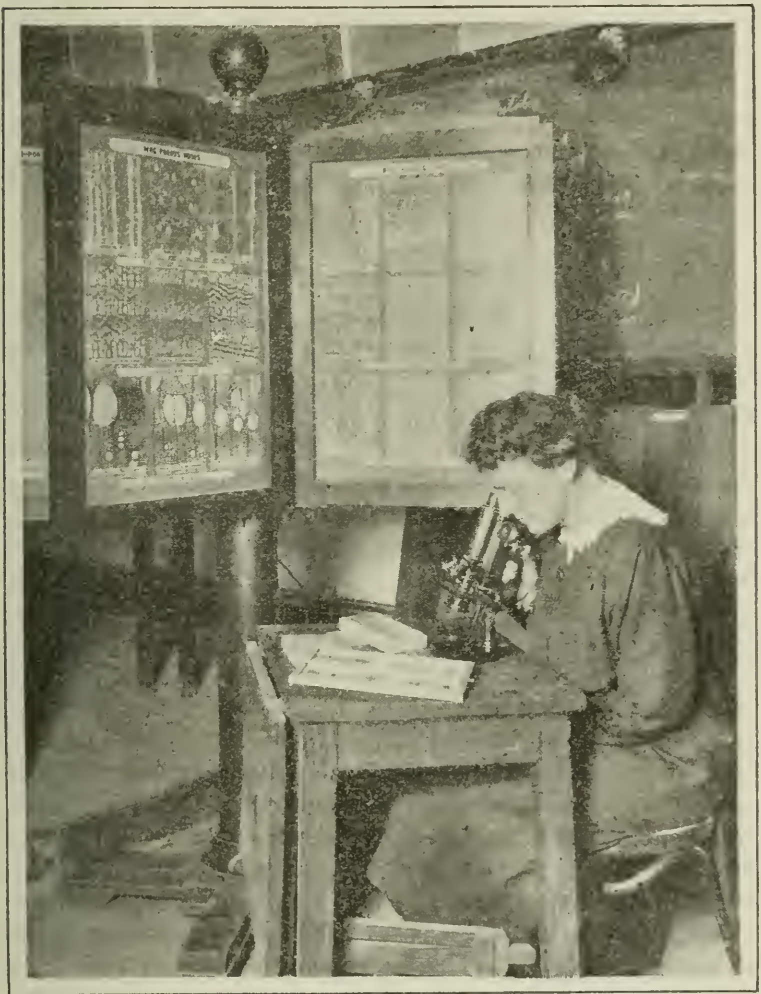


and otherwise destroyed our forests without providing for their replacement, until at last the end of the trail through the virgin forests is in sight.

Two Ways Out.

There are two ways, and only two, in which we can continue to meet our wood requirements. One of these is to grow more wood: the other is to use more effectively what we have. We must see that our remaining 137,000,000 acres of virgin forests are cut in such a way as to maintain the productivity of the land, and that our 81,000,000 acres of wholly idle and 235,000,000 acres of partially idle forest lands are put to work. At the same time we must see that more than a third or a fourth of the 24 billion cubic feet of wood removed from the forest each year is actually put to some beneficial use.

It is a curious fact that until a comparatively few years ago almost no thoroughgoing study was made of a material



Through the Microscope.

Studies of the structure and identification of various kinds of woods and the microscopic examination of defects for incipient decay constitute an important part of investigations in forest products. The panels in the background show how various woods look when magnified from 50 to 250 times their natural size.

that is so widely used and enters into our daily life in so many different ways as does wood. Highly paid chemists and engineers were employed to investigate steel, and concrete, and oil, and rubber, and a hundred other products, but wood was apparently taken for granted. Yet wood, being more complex, more variable, and less efficiently utilized than any of these, was actually in greater need of investigation. This need has always been recognized by the Forest Service, but not until the establishment of the Forest Products Laboratory was it possible to undertake the work in an effective way. Since then the progress that has been made constitutes a fascinating story of achievement in a hitherto almost unexplored field.

New Woods for Old.

Ten years ago, when John Jones wanted anything made of wood, from an ax handle to a barn, he went on the general principle that what was good enough for his grandfather was good enough for him. As a result several million John Joneses, including architects, builders, vehicle manufacturers, and other wood users, wasted an amazing amount of perfectly good material that might have been saved by the equally effective use of less valuable species, lower grades, or smaller sizes. Perhaps this did not matter much so long as high-class material was abundant. Moreover, if any unusually farsighted member of the Jones family had wanted to practice thrift he would have had difficulty in doing so, since adequate information as to the properties of the various woods was decidedly lacking.

To-day the tables are turned. The better woods are now so scarce and so high priced that if John Jones continues to use them as indiscriminately as in the past he is likely some fine morning to find himself bankrupt, while his neighbor, Bill Smith, is prospering. The difference is that Smith has had the good sense to make use of the information now available as a result of over half a million tests on 149 kinds of native woods. These make it possible to substitute knowledge for guesswork in utilizing wood for the thousand purposes in which its strength, elasticity, toughness, and other mechanical properties play an important part.

In the building trades alone, grading rules based on the discovery that the strength of southern yellow pine and Douglas fir varies directly with the relative amounts of springwood and summerwood now make it possible to secure the same strength as before from structural timbers with the use of about 20 per cent less material. If universally used, these rules would bring about an annual saving of approximately $40,000,000, of which it is estimated that some $4,000,000 is now saved each year. An additional saving of perhaps $2,000,000 is being effected by the substitution for more valuable species of cheaper woods, the suitability of which has been demonstrated by mechanical tests.

Millions of feet of hickory, the standard wood for handles and spokes, have been wasted because of the general belief that the red heartwood was inferior in quality to the white sapwood. Exhaustive tests proved that this prejudice is unfounded and that weight for weight sound heartwood is fully as strong and tough as the sapwood. This discovery not only increased materially the available supply of hickory, but converted the large amounts of heartwood formerly wasted in the woods and at the mill from a liability into an asset. Verily, the trash of one generation is the treasure of the next.

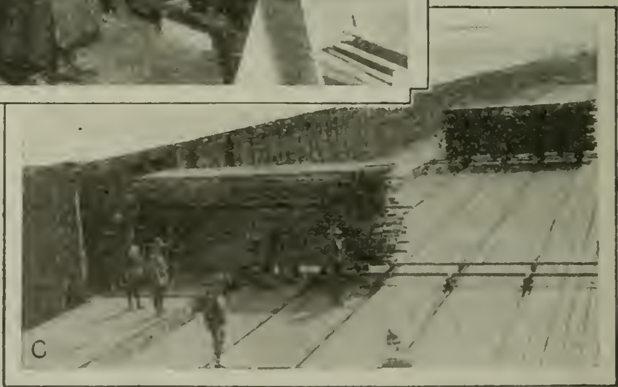
Speeding Up Nature.

Equally astonishing results have been obtained in the artificial seasoning of timber. Dame Nature's method of removing water from wood by air drying is slow, wasteful, and expensive. Previous generations, to be sure, have had to put up with it, but in these days when subways, airplanes, and wireless are abolishing time and distance no one can afford to wait several years for a piece of dry wood. So man has speeded up nature by the use of dry kilns. These have now been perfected to the point where some 35 of the more important woods in common use, such as Douglas fir, southern yellow pine, spruce, gum, and oak, can be dried in much less time and with greatly reduced losses. Already the new methods are saving some $5,000,000 a year, with the prospect of a very much wider future usefulness. Here is a field where haste, properly directed, does not mean waste.

During the war certain woods, such as spruce for airplane wing beams, walnut for gunstocks and airplane propellers,

A. Propellers in the Making.

B. Gluing Up Plywood.



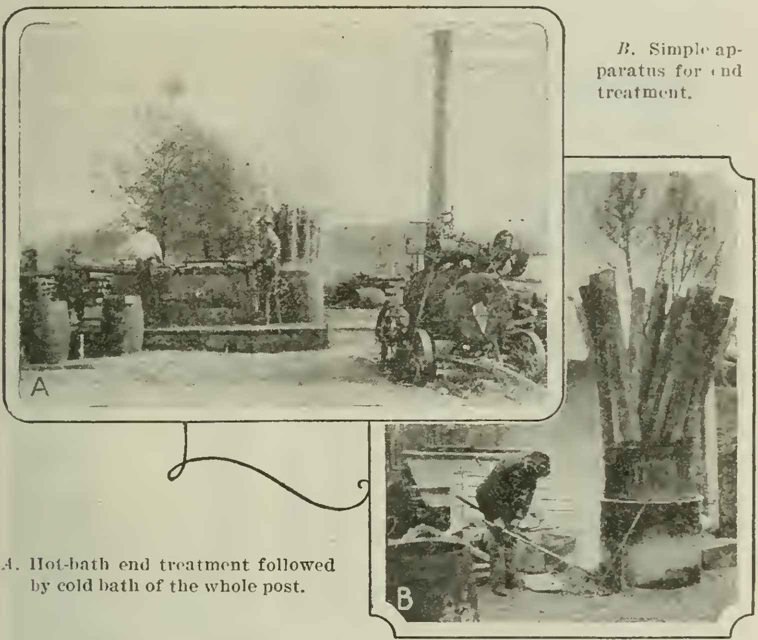
C. Uncle Sam Speeding Up Nature.

A. Airplane propellers are made by gluing together several boards and then carving out the propeller by hand. Many studies have been made to determine the most satisfactory kinds of wood to use, proper manufacturing conditions, and methods of rendering the finished product waterproof.

B. Mechanical glue spreader of the type commonly used at the Naval aircraft factories in the manufacture of plywood wing ribs and other airplane parts.

C. Prior to the war from one to two years of air drying was regarded as necessary for the production of satisfactory spruce and Douglas fir stock for wing beams. Investigations by the Forest Products Laboratory proved that equally good stock could be produced in a specially devised dry kiln in from 20 to 40 days. This is the first load of Douglas fir wing beams coming from a battery of 24 such kilns erected by the Spruce Production Division of the Army at Vancouver Barracks, Wash. At the time of the armistice these kilns were turning out 40,000 board feet a day of high-grade stock for the United States and its allies.

and oak for heavy vehicles and artillery wheels, were indispensable in supplying the boys in France and on the high seas with the munitions of war. Air-dried stocks of these woods were not to be had. Improved methods of kiln drying, therefore, had to be devised and put into operation if the Army and Navy were not to be seriously crippled. So



B. Simple apparatus for end treatment.

A. Hot-bath end treatment followed by cold bath of the whole post.

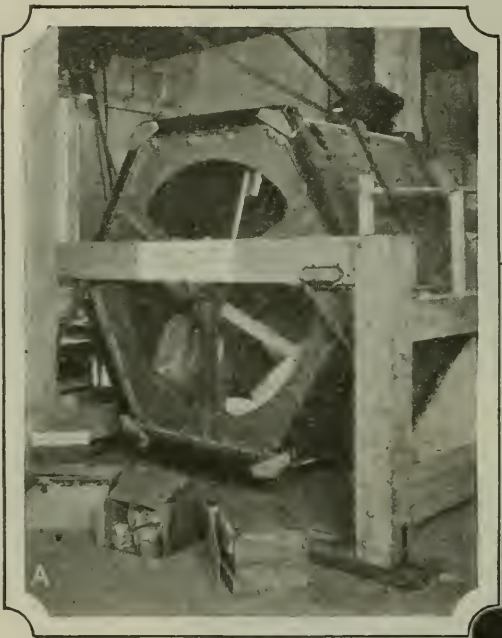
Pickling Posts.

The amount of wood destroyed each year is approximately equal to the loss from forest fires. This decay, much of which takes place in the 900,000,000 posts used on farms and elsewhere throughout the country, is to a large extent preventable by the use of preservative treatment. Could such treatment be applied to all wood used under conditions where it is subject to decay, it is estimated that the annual saving would amount to some 6,000,000,000 board feet, or nearly a fifth of the total lumber cut.

successfully was this done that in the case of spruce and Douglas fir, for which one or two years of air drying had previously been regarded as necessary, satisfactory stock for airplane wing beams was produced in from 20 to 40 days in kilns devised by the Forest Products Laboratory. At the time of the armistice a battery of 24 such kilns at the Government cut-up plant at Vancouver Barracks, Wash., was turning out daily 40,000 board feet of high-grade stock. In speaking of the results secured, the officer in command of the plant said, "This material is perfect in appearance and

A. Rougher Than A Stevedore.

This revolving drum was devised by the Forest Products Laboratory to test the strength and general suitability of boxes and crates for the shipment of such materials as canned goods, fresh fruits and vegetables, clothing, munitions of war, and manufactured products of all sorts. Hazards and guides are so arranged on the inside faces that as the drum revolves the boxes are subjected to the same kind of hard knocks and drops that they would receive in actual transportation and other rough handling.



B. Building Better Boxes.

These two boxes, used for the shipment of six-inch trench mortar shells, have been subjected to the same number of tumbles in the box testing machine. The box at the right is a redesign by the Forest Products Laboratory of the one at the left. It not only withstands more satisfactorily an equal amount of rough handling, but saves from 15 to 21 per cent in shipping space and 32 per cent in lumber required, and is much easier to pack and unpack.

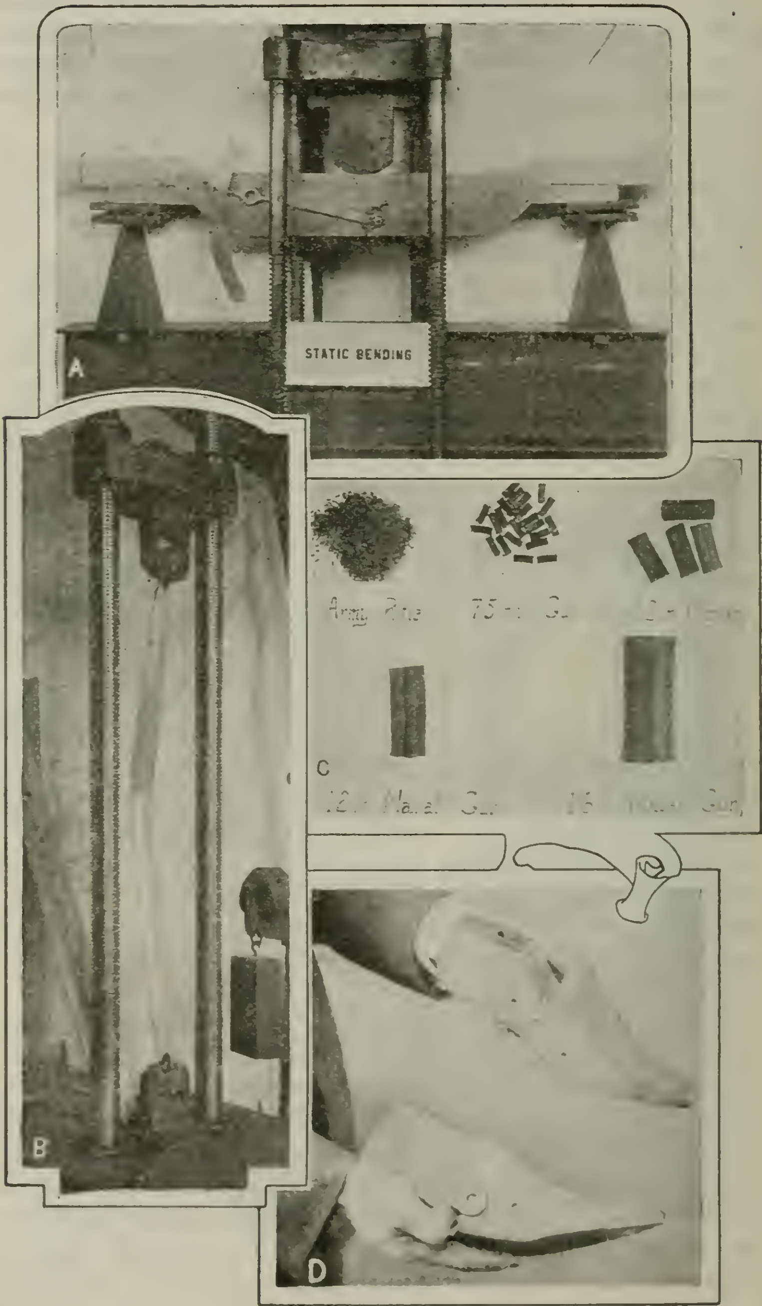
the strength tests made by our technical department show that the kiln-dried lumber retains its full strength as compared to the strength of the most carefully air-seasoned stock. The drying is so successful that we have had no cullage at all."

Kiln drying of walnut for gunstocks and airplane propellers in some cases reduced the loss of material from 60 to 2 per cent, and in others shortened the time required by approximately one-third. Incidentally, the efficiency of airplane propellers, one of the chief defects of which was their tendency to change shape as a result of absorbing moisture, was greatly increased by devising an aluminum-leaf coating which was practically 100 per cent waterproof. Three-inch green oak for heavy wagons and artillery wheels, which the War Department had previously insisted must be air dried for at least two years, was successfully conditioned in 90 to 100 days. Moreover, better stock was secured with noticeably less waste. Thus three large plants using the Forest Service system had negligible losses as compared with those in plants using other methods, where the losses ranged from 10 to 100 per cent.

Defying Decay.

Wood-destroying fungi are less spectacular than forest fires but none the less deadly. How many realize that the drain upon the forests caused by the necessity of replacing decayed railroad ties, mine timbers, poles, posts, piling, bridge timbers, and other material used under exposed conditions equals the loss due to fires? The remedy is to defy the decay-producing organisms by treating the wood with creosote, zinc chloride, sodium fluoride, or other good preservative.

A single example will indicate the possibilities in this direction. The average life of an untreated railroad tie is about 7½ years; of a properly treated tie approximately 15 years. If all of the 85,000,000 railroad ties at present untreated were treated, an annual saving of 1½ billion board feet would be effected. Could similar treatment be extended to all wood used under conditions where it is subject to decay, the annual saving would rise to some 6 billion board feet, or nearly a fifth of the total lumber cut.


STATIC BENDING
A
B
C
D

A. When Will It Break?

The strength and elasticity of different kinds of wood under continuously applied loads are determined by static bending tests. The variation between species is illustrated by the fact that small, clear pieces of air-dry white pine will bear a maximum load of only 9,600 pounds per square inch as against 16,700 pounds for longleaf pine. Similar pieces of mockernut hickory are so elastic that they will recover their form immediately upon the removal of a load of 13,500 pounds per square inch, while basswood will not do so beyond a maximum load of 7,300 pounds.

B. Eliminating Guesswork.

During the war methods were developed whereby the strength of airplane struts could be determined by actual tests. It was found that the maximum load could be applied without injury to the strut, which would resume its shape immediately upon removal of the pressure. Many struts tested in this way supported a load of from 5,000 to 6,000 pounds, with a deflection of from one to two inches at the center.

C. Smokeless Powder from Wood.

The suitability of wood pulp for the production of nitrocellulose has been conclusively demonstrated. All of these samples except the 16-inch naval-gun powder were made from wood pulp which met satisfactorily all the chemical tests for purity and stability.

D. The Latest in Shoe Lasts.

Shoe lasts built up by the gluing together of several thin laminations promise to replace largely those turned from solid blocks of wood. It ordinarily requires about two years to air-season the solid blocks. The laminated lasts made from one-inch waste stock are easily dried and have given excellent service under the most trying conditions. Satisfactory results have also been obtained from built-up articles such as bowling pins and wagon axles, bolsters, hubs, and poles.

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While it would be Utopian to expect human nature to attain such perfection, it is not unreasonable to look forward to a sufficiently wide use of preservative processes to save several billion board feet of timber a year. This is particularly true because further investigations are leading both to greater efficiency and to decreased cost of treatment. Thus it is estimated that recent decreases in cost of treatment resulting from improved processes have effected an annual saving of $625,000 on the very small proportion of material now treated.

Consider the Humble Box.

In the construction of various products made of wood we are unbelievably wasteful and inefficient. Consider, for example, the toll exacted by so commonplace and apparently simple an article as the humble box. About 15 per cent of the annual lumber cut of the country now goes into the making of boxes and crates, the vast majority of which are unsatisfactory in shape, size, strength, or some other important respect. The net result is a formidable waste of material and an appalling loss due to breakage. It is difficult to estimate what this loss means to the farmers and manufacturers of the country, practically all of whose products are shipped in wooden (or fiber, which is derived from wood) containers of one sort or another. We do know, however, that in 1919 the railroads paid over $100,000,000 for goods lost and damaged in shipment as a result of faulty containers, and that these constituted but a small part of the total loss.

Tests of thousands of containers made with a revolving drum devised by the Forest Products Laboratory have made possible improved designs which increase strength, decrease cost, or save shipping space. One of the interesting results has been to dispel the erroneous impression that some kinds of wood are so superior to all others for making serviceable boxes that their exclusive use should be specified. In point of fact the kind of wood is less important than the method of nailing; so much so, indeed, that the poorest species when properly nailed is superior to the best species when improperly nailed. An excellent illustration of the importance of nailing is afforded by tests of apple boxes made of western yellow pine, in which an increase in the number of nails per nailing edge from 4 to 6 almost doubled the amount of rough handling the boxes would stand before failure occurred in the tops and bottoms.

During the war specifications prepared largely by the Laboratory and adopted by the War Department made possible the use of some 40 kinds of wood in place of white pine alone, permitted thinner material, allowed greater latitude in design and construction, saved from 10 to 40 per cent in cargo space, and reduced losses in certain containers on their arrival in France by 85 per cent. The adoption of improved specifications by several large associations has saved at least a million dollars annually. One association alone which uses 150,000,000 boxes a year for canned goods reports that 60 per cent of its boxes can now be made more efficiently with less lumber. At a saving of approximately 1 cent a box this means an annual saving of $900,000 in addition to the decreased amount of lumber necessary.

Here is the statement from a company using about 200,000 boxes a year, which translates Franklin's old couplet—

A penny saved is twopence dear;
A pin a day's a groat a year—

into modern industrial prose: "There would be a saving on nails by using 4d. slims instead of 4d. regular of about $350; there would be also be a saving of 1 pound per box in weight on which we would have to pay the freight as we shipped out our goods, which would make another indirect saving of about $400. * * * It is safe to say that we can save approximately $3,000 on account of adopting the box as recommended."

"Think Naught a Trifle."

Striking examples of poor utilization are also afforded by the group of industries using small-dimension stock, such as those manufacturing handles, spokes, chairs, furniture, toys, and agricultural implements. There is probably not one of these in which at least an equally good product could not be produced with from 10 to 50 per cent less material. A manufacturer of hickory handles has stated that it sometimes requires 2 tons of lumber to produce 400 pounds of handles. Since only a third of the tree gets into the form of lumber, this means that barely more than 3 per cent of the material in the tree is actually utilized in the finished product. In the furniture industry from 40 to 60 per cent of the raw lumber is frequently wasted.

These wastes are largely due to the present practice of cutting small-dimension stock from lumber rather than direct from the log, and to the fact that sizes are not standardized. Closer utilization of the material now used and an interchange of material between the various industries would result in a tremendous saving. Some optimists have estimated that all requirements for small-dimension stock could be met from timber now wasted. This would mean an annual saving of some 5 or 6 billion board feet and a correspondingly reduced drain upon the forests. Such a prospect tempts one to paraphrase the words of the poet:

> Think naught a trifle, though it small appear;
> What once was waste now maketh profit clear.

Using all but the Knot Hole.

A golden opportunity for the utilization of what is now classed as low-grade and waste material is offered by "built-up" construction. This consists merely in gluing or otherwise fastening together a number of small pieces of wood in such a way as to build up an article ordinarily made of a single piece of solid wood. Thus there are now under test shoe lasts, hat blocks, bowling pins, baseball bats, wagon bolsters, wheel hubs, and other wooden products that have been put together in just this way. The new process not only uses less wood but actually permits the salvaging of material now consigned to the scrap heap. Furthermore, there is no apparent reason why the same principle should not be extended to the building up of larger materials, such as structural timbers.

Here is a possible means of stopping in large part the biggest leak in the entire field of wood utilization. Of the wood in the forest some 25 per cent is now lost in the woods, 40 per cent at the mill, 5 per cent in seasoning, and from 5 to 10 per cent in converting the raw lumber into the finished product. Moreover, the replacement of our magnificent virgin forests by small-sized, poorly formed, often defective, second-growth trees is making it increasingly difficult to secure high-grade material. The problem is to find some way of utilizing the 75 per cent now wasted and of making the low-grade material from our inferior second-growth forests do the work for which high-grade material has heretofore been regarded as indispensable. Built-up construction, by making possible the use of odds and ends cut from low-grade lumber, slabs, edgings, and other material now wasted, may furnish the answer.

Genesis of an Artillery Wheel.

The rims for artillery wheels are made by bending heavy planks, usually of oak or hickory, after steaming to soften the wood, to a semicircular shape. After bending there is a difference of nearly a foot between the inside and outside semicircumference of a plank 3⅝ inches thick used for a 56-inch artillery wheel rim, which indicates the strain on the wood. During the war improved methods of bending were developed whereby the loss of material, which in many cases had run as high as 50 per cent or more, was considerably reduced.

One of the striking things about built-up products is that if properly made they are not only fully as serviceable as similar articles made of solid wood, but that the glued joints are ordinarily stronger than the wood itself. Their chief weakness lies in the fact that when they are subjected to constant immersion in water or to alternate drying and wetting, they must be made of waterproof glue, a thing that does not yet exist. During the war marked progress was made in the improvement of glues and in the manufacture of water-resistant plywood. as a result of which the War Department was able to save $6.000.000 in the purchase of this material. But the ideal glue is still to be found; and so it happens. curiously enough, that in perfecting built-up, or "layer cake," construction the investigation which just now seems most essential does not have to do with the wood itself, but with the material by which the different pieces of wood are held together.

When is Wood not Wood?

All who read the daily paper will think immediately of one answer. But there are many others. For wood is a complex chemical substance from which a host of other chemical products can be obtained. The more we know about it the more nearly limitless seem the possibilities in this direction. Already products derived from wood are being used in the manufacture of such important and widely diversified articles as news and writing paper, linoleum, artificial silk, gunpowder, paints, varnishes, soaps, inks, celluloid, sausage casings, acetylene, chloroform, and iodoform. The time may indeed come when wood will be less sought as such than as a source of various chemical derivatives.

Where Our Paper Comes From.

At present the most conspicuous of these derivatives is paper, 90 per cent of which is manufactured from wood. The paper industry employs 110,000 persons, has an annual output valued at $850,000,000, and consumes each year some 6,000,000 cords of wood, the product of more than a million acres of forest. Over 60 per cent of this is spruce and the great bulk of the remainder hemlock, balsam, and poplar. Nearly all of the wood pulp thus comes from four kinds of wood, and chiefly one, with a corresponding drain upon the forests of these species.

Tests on the suitability of some 50 species of American woods for the production of chemical pulp and of some 25 species for mechanical pulp have shown to what other woods we can turn as the supply of those now in use gradually becomes exhausted. In fact, the practicability of substitution has already been demonstrated by actually printing newspapers on stock made of some of the more promising species. Improved methods for the cooking of chemical pulp have also been devised which have resulted in a reduction of 30 per cent in the steam used in cooking and made it easier to recover the soda used in the process. New methods have been devised for producing ground wood pulp with a reduction of 15 per cent in the manufacturing waste.

In the wrapping-paper field, methods for utilizing the southern yellow pines, hitherto regarded as unsuitable for the commercial production of paper pulp, have been developed and the industry established. What this means in the way of increased production is indicated by the fact that one of the largest lumber companies in the South is now turning its woods and mill waste into paper pulp at the rate of some 60 tons per day. During the past year marked progress has been made in working out methods to enable the use of the southern pines, such as shortleaf, in mixture with hardwoods, such as red gum, for the production of book paper, and one large manufacturer of book paper is taking steps to introduce the methods in his mill.

All of this work has tended in the direction of forest conservation by opening up new sources of supply, introducing more efficient methods of manufacture, and developing a market for material previously wasted. Studies are under way looking toward a further saving of material with an estimated value of $16,000,000 now lost through the decay of pulp wood and wood pulp while in storage. Another means of decreasing the drain upon the forests for wood pulp lies in the utilization for paper pulp of hull fiber and second-cut cotton linters. It has been demonstrated that these products, which were previously of little value and of which some 200,000 tons a year are available, can be made into high-grade paper. Several large plants for the utilization of this material have been established with a potential daily production of 300 tons, having a sale value of $15,000,000.

Wood Alcohol Valuable—But not as a Beverage.

Wood alcohol is a chemical wood product which is not to be scoffed at in spite of the fact that it will not pass muster as a beverage. It is in fact indispensable in various chemical industries, and has so far been produced only by the destructive distillation of wood. A companion product of the distillation is acetate of lime, from which are derived acetic acid, acetone, acetic ether, and other substances used extensively in numerous chemical manufactures. The residue from the distillation consists of charcoal, which is valuable not only as a fuel but in the smelting of iron, tin, and copper, in the manufacture of gunpowder, as an insulating material, as a clarifier in sugar refineries, and for other purposes. From the standpoint of our wood supply these products are important not only because of their intrinsic value but because they afford a profitable means of utilizing low-grade and waste material, such as small and crooked trees, limb wood, and slabs.

For many years birch, beech, and maple have been the standard species for hardwood distillation, and have often been regarded as the only ones suitable for the purpose. Investigations have proved that this is not true and that many other hardwoods, such as oak, gum, elm, ash, and hickory, can be successfully used. Moreover, the crude methods of distillation previously in use have been greatly improved. For example, by controlling the temperature in the distillation process it proved possible to increase the yield of wood alcohol and acetate of lime by from 10 to 15 per cent without extending the time of distillation and with a decrease in the amount of fuel required. The importance of this discovery, which means an annual saving of $400,000, was keenly felt during the war, when acetone, one of the materials in urgent demand for military purposes, was almost impossible to secure in sufficient quantity. More recently increased yields of wood alcohol running as high as 50 per cent have been obtained by the simple device of adding a cheap chemical, such as sodium carbonate, to the wood, in the form of chips or sawdust briquettes, prior to its distillation.

Quite different products are obtained in the distillation of resinous woods, particularly longleaf pine, depending on the methods used. The destructive distillation process gives wood turpentine. tar oils, tar pitch, and charcoal, while the extraction or solvent process gives wood turpentine, pine oil, and resin. Stumps and "lightwood" are the materials which have been largely used by these processes. since only very resinous wood is suitable. Through standardization and refinement, both of the process and its products, assistance has been given to the industry, which uses waste wood as a raw material.

Keeping Up Our Spirits—of Turpentine.

The naval-stores industry, the annual products of which still exceed $40,000,000 in value and constitute approximately 80 per cent of the total world production, is commonly regarded as a dying industry in the United States. Its life can be saved only by perpetuating the forests, but it can be prolonged by devising methods of tapping which will give larger yields with less injury to the tree. A marked advance in this direction, with an annual saving of $4,000,000, came when investigations led to the substitution of the modern cup and gutter system for the old box system. Under the new system 20 per cent more gum can be obtained, the deterioration of the timber is much less, and the danger from fire is greatly decreased. More recent investigations are proving the possibility of further modifying present methods so as to prolong the life of the trees, thus giving still larger total yields both of naval stores and of lumber.

Feeding Cattle on Sawdust.

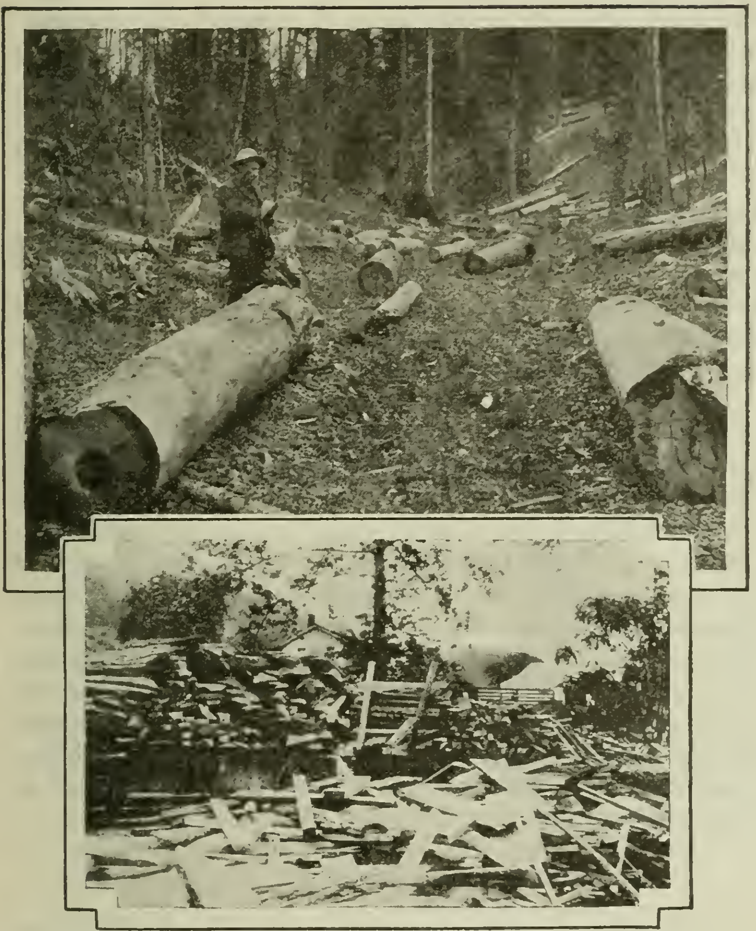
Everyone has heard of the farmer who fed his cow on sawdust and had just about concluded that the experiment was a success when the cow died. To-day that selfsame farmer might repeat the experiment with less fatal results. Only in place of the common sawmill variety of sawdust, which still is and probably always will be highly indigestible, he would use what the chemists call "hydrolyzed" sawdust. By this they mean sawdust that has been cooked with a weak acid in such a way as to convert a part of its cellulose into sugar. Although this sugar is not sweet like cane or beet sugar, it has good nutritive properties which would apparently make possible its substitution in part, at least, for other carbohydrate foods. Here are the ingredients necessary for preparing the new feed: Sawdust, dilute sulphuric acid, hot water, and lime.

Mix the sawdust and acid. Cook for 15 to 20 minutes under a steam pressure of 115 pounds per square inch. Extract the sugars now contained in the solution by washing

Sawdust for Stock Feed.

When sawdust is cooked with weak sulphuric acid, part of the cellulose in the wood is turned into sugar. By boiling this sugar solution down to a thick molasses and mixing it with the dried residue, a bran-like product is obtained which gives promise of having considerable value as a stock feed. In some preliminary feeding experiments in which it was substituted in part for barley, the cattle not only maintained their production of milk and butter fat but gained slightly in weight.

with hot water. Neutralize the sulphuric acid with lime and filter or allow to settle. Evaporate the sugar solution under reduced pressure to a thick molasses. Partially dry the sawdust residue. Add the molasses, stir thoroughly, and dry the mixture to a moisture content of not more than 12 per cent.



We Must Stop Wasting Two-Thirds of Our Wood.

One of the Leaks (above): Only 30 per cent of the wood in a forest is at present converted into lumber. Some 25 per cent of the remainder consists of woods waste in the form of small and defective trees, tops, limbs, and stumps. Small dimension stock, built-up construction, and wood distillation offer possible uses for a considerable part of this.

Potential Alcohol (below): Fuel for running our automobiles may soon come in large part from mill waste such as this. From 20 to 25 gallons of ethyl, or "grain," alcohol can be obtained from a ton of dry coniferous wood by treating it with dilute sulphuric acid and then fermenting the resulting sugar solution. It is estimated that some 300,000,000 gallons of alcohol a year could be produced from material now wasted at the mill.

When white-pine sawdust is treated in this way the sugars in the final product average from 14 to 18 per cent of the dry wood, and this proportion can probably be increased. Similar results can doubtless be obtained from any of the nonresinous and perhaps some of the more resinous coniferous woods, but hardwoods give much smaller yields of sugar. The hydrolyzed sawdust, which somewhat resembles bran in general appearance, may not sound particularly appetizing to human beings, but is apparently eaten with relish by cattle. Moreover, when substituted in part for barley at the rate of 2 pounds of hydrolyzed sawdust to 1 pound of barley, it seems to agree with them. In some preliminary feeding experiments in which, in addition to alfalfa hay and corn silage, the cattle were given a concentrate mixture consisting of about 25 parts of hydrolyzed sawdust, 30 parts of barley, 30 parts of wheat bran, and 15 parts of linseed meal, they not only maintained their production of milk and butter fat, but gained slightly in weight.

Considerable further investigation is necessary before hydrolyzed sawdust can be placed on the market as one of the standard stock feeds. Enough has already been done, however, to indicate the possibilities in this direction. Sawdust, which now claims 13 per cent of the wood in the log, has long been regarded as one of the most hopeless of our wood wastes. Just think what it would mean, particularly in regions such as the Pacific Northwest, where carbohydrate feeds are scarce and sawdust abundant, to be able to convert it into beef!

Wood Waste for Motor Fuels.

Perhaps a still more promising outlet for sawdust and other forms of mill waste lies in converting them into ethyl, or "grain," alcohol. The process for doing this resembles closely that for manufacturing hydrolyzed sawdust up to the point where the sugar solution is boiled down to a molasses. Here a new step intervenes, namely, the fermentation of the sugars through the addition of yeast, the growth of which has been started in molasses. After the fermentation is complete the alcohol is separated from the rest of the solution by distillation. From 20 to 25 gallons of 95 per cent alcohol can be obtained from a ton of dry coniferous wood, such as Douglas fir or southern yellow pine. This is more than can be obtained from a ton of sugar cane containing 75 per cent juice of which 14 per cent is fermentable. As in the case of hydrolyzed sawdust, the yield from hardwoods is much less, but may perhaps be increased as a result of further investigations.

No great stretch of the imagination is required to look forward to the day when ethyl alcohol derived from wood will be one of our important motor fuels. Already, as the supply of gasoline is becoming more restricted, alcohol, which is a more efficient fuel, is beginning to be used in small proportions as a substitute. Present sources of supply, of which cane and beet molasses are the most important, are utterly inadequate to meet the enormous prospective demand without turning to grains, potatoes, or other starch-containing materials commonly used as food.

Wood offers a way out. Thus, it is estimated that from material now wasted at the mill some 300,000,000 gallons of alcohol could be produced annually. While this falls far short of the consumption of gasoline, it compares favorably with the amount available from the world's present production of blackstrap molasses, and could be increased many times by utilizing small, inferior second-growth trees and low-grade material now used for other purposes. Indeed it is well within the realm of the possible that the time will come when one of the specific purposes for which trees are grown will be the production of alcohol. Who knows but that some day we shall rely upon successive crops of trees to act as the medium through which the sun's energy is converted into power for running our automobiles?

Dreams That Come True.

The results that have been achieved in 10 short years of research in the field of forest products open the way to future achievements which require the imagination of a Jules Verne to do them justice. The $30,000,000 which wood-using industries are already saving each year through the partial application of information now available is insignificant in comparison with the possibilities. What has so far been accomplished in putting our wood waste to work and in bringing about the more effective utilization of material already used constitutes but a beginning. We have, however, gone far enough to vision dimly some of the infinite possibilities that lie ahead. We can be confident that what to-day is but a dream, to-morrow will be a reality. Scientific investigations in the field of forest products have already done much to promote forest conservation by pointing to ways and means of making one tree do the work of two. He would be a rash individual who would venture to prophesy how much further they may go in helping us to make the most of our dwindling wood supply.

MILK FOR MIDSHIPMEN

By Ernest Kelly,
*In Charge Market Milk Investigations, Dairy Division,
Bureau of Animal Industry.*

UNCLE SAM is constantly on the alert to better his naval forces. This is manifested by bigger guns, better armament, and improved personnel. The "man behind the gun" is a big factor; but bigger yet is the directing genius that plans and guides. Officers of the Navy must possess a superlative degree of brain and brawn, courage, sinew, and clear-headedness. Of course, young Americans destined for such important duties are most carefully selected. They have to pass stringent mental tests and must be absolutely sound in wind and limb. So they go to the Naval Academy picked men from the city and the farm, the mountain and the plain.

After all the trouble and expense of selecting and training these candidates it would be downright negligent of Uncle Sam to let them become undernourished or weakened in any way; for a sick man is an inefficient man mentally as well as physically. It is not surprising, then, that specialists are constantly at work to determine the purity and efficiency of all that the young midshipmen put into their stomachs.

Typhoid Fever—Then New Plans.

Nearly 11 years ago, in the fall of 1910, an outbreak of typhoid fever occurred at the Naval Academy. The Secretary of the Navy appointed a medical board which, after careful investigation, reported that the infection came through the milk supply. At that time the academy was using about 150 gallons of milk daily. The supply was irregular and came from scattered dairies. This outbreak, coming like a bolt from a clear sky, convinced Paymaster Samuel Bryan, who was then midshipmen's storekeeper and commissary officer, that the only proper course was the erection of a modern sanitary dairy, owned and operated by the academy.

Accordingly, every effort was made to obtain funds for the project, and by January, 1911, $25,000 had been set aside for the purpose, and work on the dairy was commenced. It took some stretching to make $25,000 purchase 100 cows and erect up-to-date cattle barns, feed barn, silos, milk house, etc., but it was done.

The Navy did not waste any time. Paymaster Bryan called on the Dairy Division of the Department of Agriculture for help. Blue prints were prepared; land was surveyed; and in October, 1911, only 10 months after work was begun, the cows were chewing their cuds in their new sanitary homes and a stream of pure milk was flowing to the midshipmen's "mess."

It's an old, familiar saying that "great oaks from little acorns grow;" and it held true in the case of the Naval Academy dairy. From the beginning the success of this enterprise was assured: but soon there was a fly in the ointment. The milk was so good that it would not supply the demand. Furthermore, the land occupied by the dairy was needed by the academy for other purposes: so, literally, the institution had to "tear down its barns and build greater."

The New Naval Academy Dairy.

Congress agreed to advance $255,000 for a larger plant. Several farms, aggregating 864 acres, were purchased at Gambrills, Md., about 12 miles from Annapolis on the trolley line connecting that city with Baltimore and Washington. Work on the buildings began July 1, 1914, and the first milk was shipped from the new dairy on April 1, 1915.

At present the Naval Academy dairy is in full operation and has the appearance of a small village. Some of the old farm buildings were left on the back part of the farm,

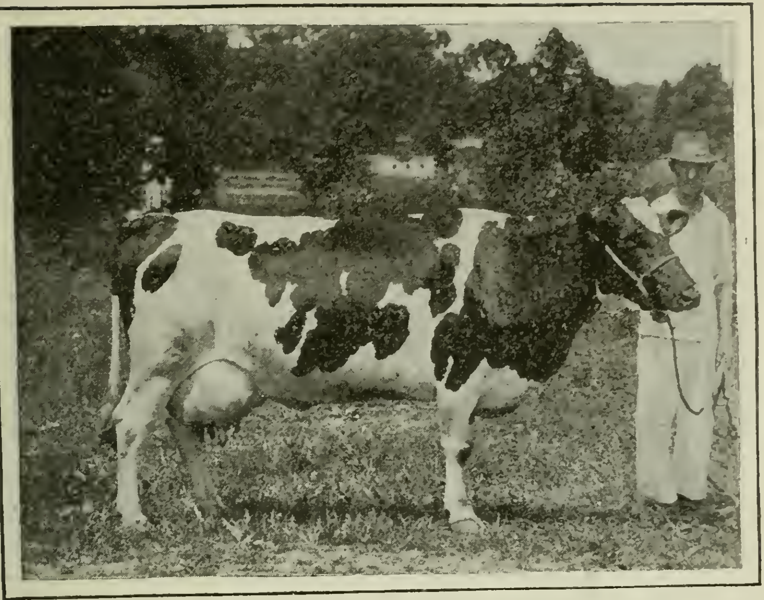


FIG. 1.—Type of Cow Used at the Naval Academy Dairy.

FIG. 2.—Cows are Housed in Hollow-Tile Stables, with Concrete Floors and Plenty of Light and Air.

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FIG. 3.—Cattle and Barn are Kept Scrupulously Clean.

FIG. 4.—The Milk House is of Sanitary Construction.

where dry cows and young stock are kept. On a high knoll near the car line stand the new buildings.

The milking herd is housed in five 50-cow milking barns, which are built of hollow tile, plastered inside and stuccoed outside. These barns are sanitary in every respect, with concrete floors and gutters, an abundance of windows, and improved ventilating systems. The cows are well bedded and stand on cork-brick platforms.

The milk house, which stands in front of the row of cow barns, is also built of hollow tile, with plastered walls and concrete floors. It contains an office, boiler room, wash room, milk room, refrigerator, sterilizer, and laundry. The equipment consists of a complete refrigerating plant and all modern apparatus essential to the proper handling of milk. Other buildings in the group are a maternity barn, a calf barn, a horse barn, a bull barn, a feed barn (under construction), five concrete silos of 180 tons' capacity each, a pump house, a dairy house, and a men's house.

What about the man power necessary to run such an enterprise? On an average 18 men are employed at farm work the year round, and 24 men are used in the dairy itself to feed and milk the cows and care for the milk. The single men live in a spacious dormitory and mess house; the superintendent, herdsman, and married employees occupy 18 cottages on the grounds.

The Herd is Tuberculin Tested.

At present there are 223 cows on the farm, 170 of which are in milk. All are Holsteins, mostly typy grades which have been carefully selected in the big dairy districts of Ohio and New York. Forty-one registered animals have been added to the herd. Of course, the sires are all purebreds, for the men in charge have an eye to the future. Every animal is tuberculin tested before it is purchased and is retested after arrival at the farm. Government experts carefully watch the health of the herd.

The 170 cows now milked are producing 500 gallons of milk daily for about 1,850 midshipmen. But Uncle Sam made the dairy hustle during the war, for at one time 3,080 people were receiving milk, and the records show that on one day 850 gallons were shipped to the academy.

Water—But Not in the Milk.

Milk and water should not be mixed; but no good dairy can get along without an abundant supply of pure water. To meet this need, two wells were drilled, capable of delivering each minute 82 gallons of excellent water which flows into a concrete reservoir having a capacity of 114,000 gallons. A fire pump in connection with this water system gives protection against fire, though the buildings are as near fireproof as possible. So much for equipment; but

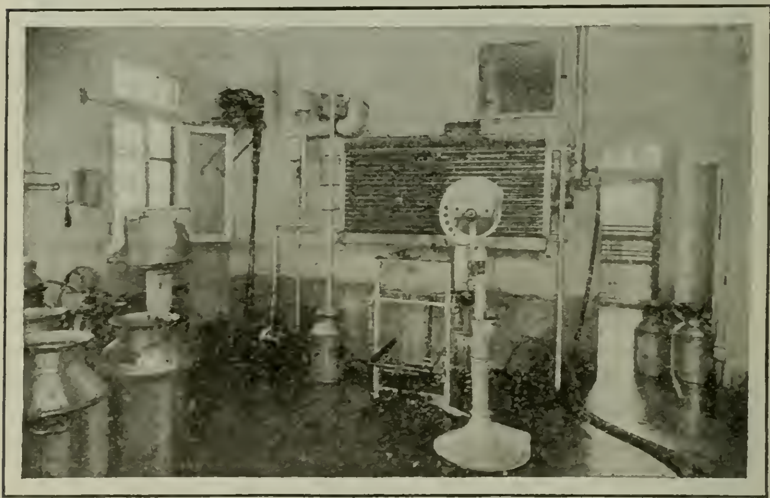

FIG. 5.—The Milk is Cooled in This Separate Room.

that's only part of the story of clean milk. Plenty of running water makes it possible to scrub the barns and milk house daily, so that everything is spick and span. The cows are groomed, and just before milking time their udders, teats, and flanks are thoroughly washed with clean water. Then the attendants, clad in clean, white suits, attach the milking machines which draw the milk into sterilized pails. From the barns the milk is hurried to the milk house, where it is immediately chilled until nearly ice-cold, to prevent the growth of bacteria. It is then placed in clean cans and loaded on the trolley, which takes it to the big refrigerator at the academy "mess hall."

Special attention is paid to the milk pails, cans, milking machines, cooler, and everything that comes into contact with the milk. Every piece of apparatus is scrubbed with warm water and washing powder. Then it is rinsed and placed in the big steam sterilizer, where it is subjected to the action of live steam for half an hour.

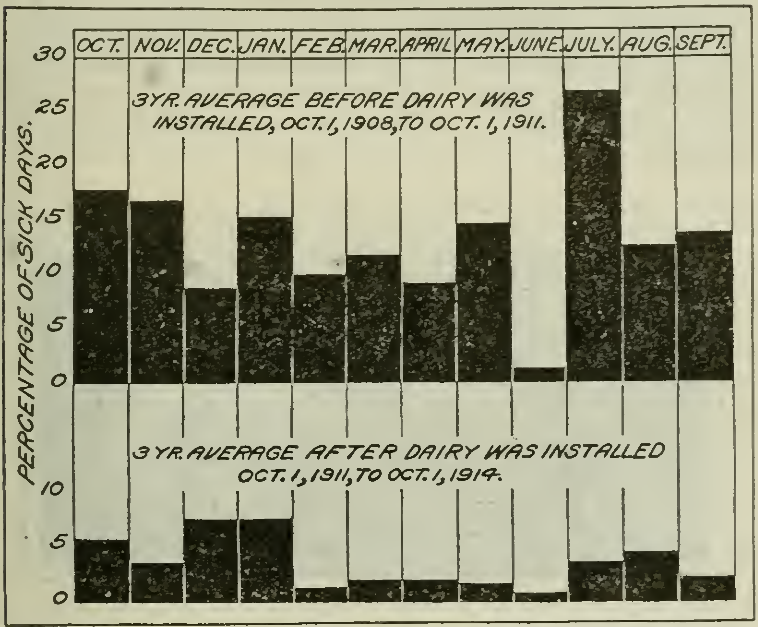

FIG. 6.—Chart Showing Decrease of Gastrointestinal Disorders at Naval Academy.

"All very well," you may say, "but has it been worth while?" Your question would be answered if you could see those clear-eyed, husky midshipmen at mealtime. They have all the milk they will drink twice a day and three times in summer. It is an exceedingly popular part of the diet.

Sick Days Decrease.

The authorities at the academy are well pleased with the results. Gastrointestinal disorders used to be of fairly frequent occurrence; now they are so infrequent as to be negligible. Whether this is due to more milk, better milk, or other factors, no one can positively tell; but there is more than a strong presumption that good milk is the explanation.

From 1902 to 1910, before the dairy was begun, there was an average of 574 sick days a year from gastrointestinal disorders among the midshipmen. A "sick day" means one man sick for one day. By 1918, with about three times as many men at the academy, there were only 203 sick days.

Whatever the cause of this improvement, pure milk for midshipmen is here to stay, for the authorities are convinced that better health and efficiency accompany the cow and her product.

FOOD *for* FARM FAMILIES

By Helen W. Atwater,
Office of Home Economics, States Relations Service.

FARM DIETS in the United States are as varied as the farms and farming people. Popular ideas about them are almost as varied, and are usually made up of a curious jumble of fact and fancy. Vague recollections of his school history mixed with stock newspaper jokes have given one man the impression that farmers in New England live chiefly on baked beans and fish cakes, with the addition of five or six kinds of pie for breakfast. Another has a hazy idea that in the Southeastern States farm families revel daily in fried chicken, candied sweet potatoes, and mysterious delicacies known as corn pone, gumbo, and Lady Baltimore cake, or else subsist entirely on pork and corn meal with a little black-strap molasses in their coffee. One will tell you that American farm women are the best cooks in the world, and the next that American farmers all have indigestion because their wives make such soggy bread.

In the midst of all this variety and confusion it might seem useless to attempt definite or general statements. Nevertheless, we have two reliable sources of information, one the accurate observation of persons who really know conditions, and the other studies of the food actually used in typical farm families. From these together it is possible at least to say whether our farm population in general is adequately fed, and how their food compares in amount, attractiveness, and cost with that eaten by the Nation as a whole.

Different Food in Different Places.

What any family eats depends on what it has to choose from, what its members happen to like and dislike, and what it can afford. Before the days of quick transportation and cold storage the choice in perishable food materials was limited to what could be grown and kept near by; and even in the matter of staples, local products were much more important than at present. The farther a family was from a large trading center, the more it relied on home-grown foods; and until two or three generations ago, farm families were almost self-sufficient in the matter of food supplies, except for such things as sugar, spices, and other imported luxuries. As a result all our people, and particularly our farming people, had a much less varied diet than at present. This was especially true in winter. The many kinds of bread, pies, preserves, and pickles which appeared on old-fashioned tables show how the housekeepers tried to give variety to the meals by using the same materials in different combinations.

Local differences in diet were also caused by the differences in the traditions of the various nationalities that have settled in this country. For example, much the same kinds of food can be produced throughout the Middle Atlantic States, but the early "Pennsylvania Dutch" settlers tried to use American materials as they had used similar ones in Germany, and thus the dishes typical of their sections came to be quite different from those of their neighbors from England and Holland.

Why the Differences Are Disappearing.

Though people are usually more conservative about what they like to eat than about most other things, these regional differences are rapidly decreasing. We take it as a matter of course that in any small town and at reasonable prices we should find bananas from the West Indies, lemons and oranges from Florida or California, canned corn from Maine, sweet potatoes from New Jersey, cheese from Wisconsin, maple sirup from Vermont, flour from Minnesota, and crackers and breakfast foods made almost anywhere. Fish, which used to be considered out of the question unless one lived near the water, can now be frozen and shipped to any distance, and since it remains good until it is thawed, any farm housekeeper who can buy it still frozen from a good fish market and slowly thaw it at home can have it as easily as a woman in town. Gradually, too, the dishes peculiar to one group or one region find their way into the rest of the country. Indian succotash, Dutch crullers, Italian macaroni, German sauerkraut, and Spanish pimiento are some of our common foods whose names betray their various origins.

The adoption of new foods and dishes perhaps goes on more rapidly in towns, where people of different habits and experiences are more often thrown together, but farm families are no longer as isolated as they used to be, and everywhere local differences are becoming less and less marked. The State of New Mexico recently furnished an example of how such changes may be hastened when it issued some recipes for dishes that have long been used by its Mexican farmers and that the others in the State are now coming to enjoy.

The food conservation campaign during the war did much toward lessening our food prejudices and nationalizing our tastes in food. Then it was a patriotic duty to try new foods and dishes, and some of them proved too good to forget. Exchanging recipes has always been a favorite diversion among housekeepers, and the bulletins and leaflets distributed by the Food Administration and the home demonstration agents brought the whole country into the game. Southern recipes for corn breads were everywhere eagerly tried on "wheatless" days, while French soups, Italian rissoto, and Hungarian goulash helped to make a little meat go a long way. Since then some of the workers in the Americanization movement have seen that to get our different racial groups to enjoy the good things from each other's tables helps to make them feel more at home together; and those who deal directly with the housekeepers are trying not only to make newcomers learn the advantages of such typical American customs as the use of breakfast cereals, but also to get Americans to copy some of their new neighbors' ways, such as obtaining inexpensive and nutritious variety by the skillful use of different cheeses, flavoring vegetables, and salad greens.

Is Farm or City Diet More Attractive?

Farm diets are sometimes spoken of as less varied and attractive than those in cities. This may have been the case in years gone by, but there is no reason for it now, if there ever was. City and farm are nearly on a par as regards staple groceries, package goods, and canned goods, for a generous variety of these is carried in almost every town or can be ordered by mail. The advantage may even be with the farm housekeepers, because more of them have suitable storage space and so can save money by buying such supplies in quantity. It is easier for city housekeepers to buy out-of-season fruits and vegetables, fresh meats, and bakeshop goods, or to get supplies for some sudden need, but some of these advantages are not so great as they seem. Comparatively few people can afford fresh strawberries in January, even though they may be on sale around the corner; the cakes and cookies now put up in air-tight packages and sold by grocers or by mail are quite as appetizing and very likely more sanitary than those found in many city bakeshops; and emergency marketing, though convenient, is usually expensive. It is doubtful whether the farm woman envies the city woman her easy marketing more than the city woman envies the farm woman her new-laid eggs, her abundance of milk and cream, her freshly picked fruits and vegetables, and her stores of preserves, pickles, and jellies, all grown at home and put up according to favorite family recipes. One hears occasionally of dairy farms where the housewife buys butter for home use and seldom has cream for her table, or of fruit farms where the family contents itself with the culls, but such a state of things arouses about as much general sympathy as the proverbial shoemaker with his barefooted children.

The Food Actually Eaten by Farm Families.

Many of these general points about farm diets are brought out in studies recently made by the Office of Home Economics in cooperation with the Bureau of Markets to show the food actually eaten in typical American homes. There are 500 studies in all, made in 41 States among people of 16 national stocks. They have been placed in 16 different groups, according to the occupation of the bread winner, and among them are 73 farm families from different parts of the country and representing many types of agriculture. The yearly incomes among the other groups varied from $754 to $2,924, with an average of $1,905. The incomes of the farm families were not given because of the difficulty in estimating costs and values, but it seems safe to assume that the general economic condition among the farm families was similar to that of the general average. As regards the size of families, farm families showed more adults, but hardly more than half as many children as the average of the 500 families.

These studies bear out the general impression that on the average the farmers' families have an abundant diet, with enough different kinds of food to insure their obtaining all the substances necessary to keep them in health. In mere matter of total weight of food, the farm families stand well at the head, receiving 19 pounds per day, while the average for all the families is only 14½ pounds.

Animal foods appear to be used more freely on the farms, making up 38.3 per cent of the farm diets as compared with 35.6 per cent for the general average. This difference, however, appears to be due chiefly to the fact that larger quantities of milk are consumed on the farms.

Meat.

The average proportion of meat is much the same on the farms as in the general average, and among all the groups the differences seem to depend chiefly on the income. Both the cost and quantity of meat are smallest in the group of families where the wage earners were mothers and the yearly income was only $754, and both increase fairly regularly as one passes to the groups with more comfortable income. Among farm families the meat eaten was reckoned as worth 9 cents per man per day, while among the 500 families it was worth 8.8 cents, a difference too small to be significant. The average weight of the meat used per man per day was 5.4 ounces on the farms and 4.9 ounces in all the families. This shows a more generous use of meat than has been found by similar studies in European countries. There are no accurate or complete figures for other parts of the world, but careful observers have given fairly reliable ideas of general customs. Most Asiatics appear to use meat less freely than Americans. The heaviest meat eaters in the world are probably found on the great cattle and sheep ranches of the Southern Hemisphere. Except for them our American farmers seem to be as generously supplied with meat as any class of people and undoubtedly use as much as is needed for health and variety.

The studies do not show what proportion of the meat was from beef, mutton, pork, poultry, or game, but everyone knows that pork products and poultry have long been the commonest kinds in most rural regions, and the majority of farm families probably still depend chiefly on the pigs and chickens that they can raise at home at less cost than they can buy other meats from a butcher.

Eggs.

Oddly enough, eggs appear not to be more generally used in farm families than among our people at large. The low-income families naturally bought very few; but in practically all of the town groups where the income came up to the general average for the 500 studies, eggs were more abundantly supplied than among the farmers. This will seem surprising to many city housekeepers, who consider plenty of good eggs one of the greatest helps in serving appetizing, wholesome meals and who, although they understand the increased cost of production, will probably wonder if people in the country always appreciate their blessings.

Dairy Products.

The situation is different as regards dairy products. The average farm family used 17.7 ounces of milk per man per day, but the average for all 500 families is only 13.9 ounces. This difference represents about half a cupful a day, and amounts to a little more than 4 quarts a week for the family. There were fewer children in the average of the farm homes, which makes the use of milk by adults and in cooking appear even more generous. The butter used in farm homes was 1.3 ounces per man per day, and in the general average 1 ounce, a difference equal to about 6 ounces a week for the family. No separate figures are available for cream and cheese, but in a week the farm family used 3½ pounds of both together where the average family used only $1\frac{1}{2}$ pounds. The free use of dairy products is now considered one of the safest ways of assuring a healthful diet, especially for children, and in this respect the farm diets showed a decided advantage over most of the other groups.

Cooking Fats.

Lard and other animal cooking fats were used about twice as freely in the farm homes as in the average family, the figures being, respectively, 21 and 10 ounces per family per week. On the other hand, the average family used slightly more vegetable and mixed fats for cooking and table purposes but not enough to make up for its more restricted use of animal fats. These differences are probably due in part to the fact that animal fats are produced on the farm and therefore are less expensive there than in the city markets.

Cereal Foods.

Between 12 and 13 ounces of cereal products per man per day were used both by farm families and by the general average, but they made up a smaller proportion of the total farm diet because other foodstuffs were more abundantly used. This amount is equivalent to about a pound of bread, or a combination of 8 or 9 medium-sized slices of bread, a cupful of cooked oatmeal, a generous serving of macaroni, and $1\frac{1}{2}$ cups of flour used in cakes, pies, and general cookery.

The figures do not show how wheat, corn, oats, rye, rice, and other cereals compare in popularity among the different groups, but it is generally known that wheat is the most important grain for bread making and general cooking. Corn breads are popular everywhere, but except in the Southern States they are used only occasionally for the sake of variety. Wheat bread is the staple. "Quick" breads made of wheat flour are also used for variety, but in most parts of the country people seem to prefer the texture, flavor, and keeping qualities of yeast-raised breads. Thanks to the good, uniform quality of bread made in large factories and delivered to many grocery stores even in small towns, home baking is no longer the absolute necessity it used to be, and many farm wives now buy bread regularly. In some cases the ready-made bread costs a little more, but where time and labor are scarce the convenience is often worth the extra price. In the Southeastern States "quick" breads are still often preferred to yeast-raised kinds, even when made with wheat flour.

Sugar.

The amount of sugar and sirup used is an item which varies more with the income than with the locality or occupation. The farm families used 3.3 ounces per man per day for table and cooking purposes, a fraction of an ounce more than the general average. As these studies were all made when the price of sugar was high, it is probable that the figures represent less than normal consumption.

Vegetables and Fruits.

Vegetables and fruits, like eggs and dairy products, are among the foods in which rural families might be expected to have the advantage over those in town, and these studies show this to be the case. The average farm family used 20.6 ounces of vegetables per man per day, as against 15.9 ounces of vegetables in the general average, a difference of 30 per cent. Their use of fruits was also slightly greater—9.4 ounces as compared with 8.5 ounces.

Fruits and vegetables serve much the same dietary purposes; and considering the two together, we find that the farm families surpassed all the other occupational groups and ran about 25 per cent above the average. Unfortunately, there are no figures to show the proportions of different types of vegetables and fruits used, but the records indicate that there was a relatively large proportion of starchy vegetables and a relatively small one of green and succulent kinds. This contributed more to economy than to pleasant variety and healthfulness, for some of the substances that make vegetables and fruits particularly valuable to the body are better supplied by the more expensive leaf and fruit forms than by the cheaper potatoes and root vegetables.

Is the Food Sufficient?

With human beings, as with farm animals, we judge whether a ration is adequate not merely by the amount of food it contains but by the nutrients and energy which it furnishes. We must also take into account the needs of different individuals, and see how nearly the food they receive corresponds to the generally accepted requirement for persons of their age, sex, and occupation or muscular activity. In studying family diets, the usual way is to reckon how the total food needs of all the members correspond to those of a man in the prime of life doing moderately active muscular work, and then to calculate how the food supplied corresponds to the food needed by such a man. Another publication of this department describes how such calculations are made.[1] The food needs of each of the 500 families here studied were on the average equivalent to those of 3.6 such men, and the farmers' families to those of 4 men. The standard food requirement, for food actually eaten, of such a man has been set at 80 to 90 grams of protein and 3,150 calories of energy per day, and is generous enough to allow a fair margin of safety. Among the 500 families the protein averaged 96 grams and the energy 3,225 calories. This means that these families were receiving about one-tenth more protein than the standard called for and were also well supplied with energy. Among the 73 farm families the figures were 101 grams of protein and 3,540 calories of energy. That is, they were receiving about one-fifth more protein and one-eighth more energy than the standard. The only occupational group that appears more generously nourished is that of day laborers, who received 105 grams of protein and 3,560 calories of energy.

Besides total protein and energy, there are several other things to consider in judging how well a diet meets the needs of its users. Most important among these are the kind of protein, the amount of mineral matters, especially of calcium (lime) and iron, the presence of newly discovered substances called vitamines, the bulk and the attractiveness of the diet.

Not all kinds of protein are now believed to be equally useful in building up the body, those of animal origin, especially those from milk, eggs, and meat, doing the work more completely than those from most plants. The generous use of meat and the very generous use of milk among the

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[1] U. S. Dept. Agr., Farmers' Bulletin 142, "Principles of Nutrition and Nutritive Value of Foods."

farm families leaves no doubt that these people were getting protein adequate in kind as well as amount.

The calcium (lime) in ordinary diets is supplied chiefly by milk, and here again the farm families are out of danger.

Iron comes chiefly from meats, eggs, the outer layer of cereals, and certain fruits and vegetables, especially leaf vegetables. Probably most of the farm families studied were obtaining enough, but a freer use of green vegetables and fruits would give a wider margin of safety.

The nature of vitamines is not yet thoroughly understood, nor have they been accurately measured or even separated out from food materials, but it is generally accepted that at least three kinds are necessary to maintain health and growth. Without going into details, we may say that the best way to guard against a lack of vitamines is to include in the diet an abundance of whole milk (or such milk products as contain milk fat), eggs, and a variety of fruits and vegetables. It seems probable that most of the farm diets in these studies meet this condition; whether all the 500 studied do so is not so sure.

Bulk is commonly said to make the food pass properly through the digestive tract, and is supplied chiefly by the cellulose in fruits and vegetables and in the outer coatings of the cereal grains. Diets made up largely of meats, fine flour and meals, fats, sugar, potatoes and other starchy vegetables are likely to lack bulk as well as some vitamines, and may lead to constipation and all its attendant dangers. Many of the diets here studied probably provided enough roughage, but observation shows that the so-called "meat-bread-potato" type of diet is a common one, and also that constipation is a common complaint. It seems doubly unfortunate that such a state of things should be found among the families that have the best opportunities for growing fruits and vegetables at home.

Ways of Cooking and Serving.

In most of the 73 farm diets there was enough variety in the food materials to make possible very appetizing meals; whether the food was equally well cooked and attractively served the studies do not show, and we can judge of it only by general knowledge. There is no doubt that many of the best cooks in the country are found on our farms, and that no meals are better than the best of those served in American farm homes. On the other hand, extension workers and others who have first-hand knowledge of rural conditions report that in many cases the bread is heavy, the few vegetables used are not cooked or seasoned so as to bring out their good texture and flavor, good meat is made unpalatable by poor cooking, and there is great monotony in the meals.

The fact that almost twice as much cooking fat was used by the farm families as by the general average confirms the impression that some farm housewives are inclined to cook too many foods by frying. This is an excellent method for certain things, and almost everyone enjoys the flavor of delicately browned fat in its proper place, but a diet in which many of the foods are greasy and others have lost their good natural flavor under that of scorched fat is neither attractive nor wholesome. One of the greatest services which the home demonstration and girls' club movements are rendering is to arrange for the skillful housewives in a community to show how they cook the good things for which their tables are famous.

A little formality of a simple and suitable kind makes meals more attractive. Cleanliness in connection with food and everything in the kitchen and at the table is as necessary for sanitary reasons as it is in the dairy, and no one should ever handle food or come to the table without washing the hands. Moreover, such simple conventions as neatly set tables, courteous ways of passing food, and quiet, tidy habits of eating are almost everywhere followed because they have proved the easiest means of showing consideration for others. Extension workers find that the women in the home-demonstration work and the girls in club work are eager to learn simple, easy ways of making meals attractive as well as wholesome.

Cost of Farm Diets.

In determining the cost of food in the studies, the home-grown materials were valued at current retail prices. This puts the farm diets on the same price basis as the others, but it probably makes them appear more costly than they really were, for in many cases a considerable proportion of the food was obtained practically as a by-product of the general farm business and cost the users very little extra material or labor. Calculated in this way, the average cost of the farm diets was 45 cents per man per day, or 1 cent less than the average for the 500 families. The cost per farm family per year is figured at $660 and is $60 larger than that for the general average, because the farm families included more adults and therefore used more food. Assuming that the average income for the farm families was the same as for the others, the value of food materials used in the farm home was 35 per cent of the income as against 32 per cent in the general average.

In this connection it is interesting to remember that the proportion of the farm diet grown at home has been estimated as follows: Meat, exclusive of poultry, 75 per cent; poultry and eggs, 100 per cent; dairy products, 85 per cent; vegetables, 80 per cent; fruits, 60 per cent. Assuming that these figures hold good for the farm diets here studied, the foods grown at home furnished about one-third of the energy of the diet, and their money value was about six-tenths that of the total food.

When we consider cost in connection with nutritive value, we find that the farm diets furnished about 2¼ grams of protein and 78 calories of energy for 1 cent, while the average for the 500 studies shows only about 2 grams of protein and 70 calories of energy. The only occupational groups who got better nutritive value for their money were the three with the lowest incomes. Their diets, like most low-priced ones, contained unusually large proportions of cereals and were hardly varied enough for either enjoyment or healthfulness. Among the families who could allow themselves some choice, those of laboring men were the only ones with "heartier" diets than the farm families, that is, diets in which meats, fats, and cereals played a large part. The professional families, on the other hand, were more inclined to pay for dairy products and for different kinds of vegetables and fruits, materials that add to the healthful and agreeable variety of the diet but are relatively expensive sources of protein and energy. These foods are the ones that in many cases can be obtained on the farm at less cost than ordinary market prices, and thus pleasant and wholesome variety often costs farm families less than it does the rest of our population.

It must not be understood that all farm families or regions in the United States correspond to the average of these studies. Unfortunately, there are everywhere individual families that do not get as much food as they should, and there are very likely some that live better than is necessary, too well perhaps for their own good, but probably the extremes are less marked among rural people than in cities. It is usually cheaper to grow food in the country than to buy it in town, and so a farm family is in less danger of not getting enough to eat.

Importance of Providing the Right Kinds of Food.

There may be danger of not getting the right kinds of food, and this may happen through ignorance as well as through poverty. A good example of farm diets abundant in quantity but restricted in kind was found in studies made 15 or 20 years ago in a remote mountain district of the Southeast. Here the food supplied 20 per cent more energy than the standard calls for and the protein, 82 grams per man per day, would have been sufficient if it had been of the right kind. The diet, however, was made up chiefly of pork, corn meal, and wheat flour, with occasionally a very little milk, butter, sugar, cabbage, onion, potatoes, and wild berries in addition. Eighty-three per cent of the protein came from vegetable foods, chiefly cereals. The chances are, therefore, that these diets were not adequate as regards protein, mineral matter, vitamines, or bulk, though they were more than sufficient in energy. The people were among the economically backward groups of our rural population; and while no special sickness was reported, they were said to grow old fast. Recently pellagra has been found to be especially prevalent among people living under similar conditions, and the restricted diet is undoubtedly a contributing cause if, indeed, it is not the principal cause of this very serious disease. Such families fortunately represent an extreme condition.

American Farm Families Well and Cheaply Fed.

Fortunately, too, with better means of getting about there is less chance of such conditions arising or lasting. Every year it is easier to obtain a variety of foods, and every year, thanks to schools and colleges and extension workers, more people understand what foods are needed to make an adequate, wholesome, and attractive diet. In spite of exceptions among individual families here and there, and among larger groups in some regions, the farm families whose diet was recently studied probably give a fairly true picture of farm diets in the United States. The energy furnished is more than enough, and the protein is sufficient in amount and variety. Calcium is well supplied by the generous use of milk. There is also probably a fair proportion of iron, vitamines, and indigestible bulk, though the margin of safety for these would be greater with more eggs, coarse cereals, and a greater variety of vegetables and fruits, especially more green vegetables. With possibly a freer use of these food materials and with attractive ways of cooking and serving, there can be no doubt that the food eaten on the average American farm is abundant, wholesome, and varied enough for health and enjoyment. Common observation and accurate studies all indicate that, in general, no large group of the population is better nourished or secures its food so cheaply as the farm families of the United States.

BOYS' and GIRLS' CLUBS ENRICH COUNTRY LIFE

By C. B. Smith, *Chief*, and George E. Farrell, *In Charge of Boys' and Girls' Club Work, Office of Extension Work North and West, States Relations Service.*

"I CAN NOT BEGIN TO TELL how much help club work has been to me. It not only gave me credit for a semester's work in clothing, but also created my desire for a college education," wrote a Kansas club girl who was permitted to take a final examination for the first semester in college on the strength of her three years' experience in club work. Club work often leads boys and girls to seek a fuller knowledge of agriculture and stimulates an ambition to secure a broader education. Of those taking the regular course in agriculture and home economics in the State colleges last year over 1,800 were boys and girls who had been in club work, while over 3,300 club boys and girls took short courses at the colleges, 730 having scholarships won through their club work.

The daughter of a Bohemian baker in Westfield, Mass., the oldest of a large family of children, found her first opportunity through club work. First, she learned to can at the canning center. Then she bought equipment and canned at home evenings, after working all day behind the counter in the bakery and helping her mother with the younger children. A second and third year she continued this home-canning work, branching out by canning for several neighbors and in this way earning money which was her very own. In her second year, she wished to learn more and joined a garment-making club. At 17, she first learned how to sew, but within a year we find her with such skill that she is teaching her friends how to make their own dresses. Still her outlook on life grew, and she began to plan ways and means of getting enough together to go to Massachusetts Agricultural College for a course in home economics. One of the red-letter days of her life was the day she actually enrolled as a student at the college.

The great advantage of working with boys and girls is that whatever you do is only a beginning—a take-off so to speak, from which they leap forward to greater things. A broader education is only one of these things; in countless other ways the club work of the farm boys and girls is working toward the improvement of rural life.

Through club work, boys and girls are led to realize the possibilities of farm life and to look upon it as worthy of their best thought and effort and as offering opportunities for success and happiness second to no other occupation. How it helps to keep the boys on the farm is indicated by the experience of a Wisconsin boy who joined the calf club and raised a prize-winning Holstein calf. To use his own words, "Club work has completely changed my life plan, as my parents always encouraged me to get a mechanical education, thinking that I am best fitted for that. I thought so myself until I became interested in club work and found out what I could do."

During the past 10 years there have been numerous and striking examples of improvements in farm life and practice brought about through the influence of this work.

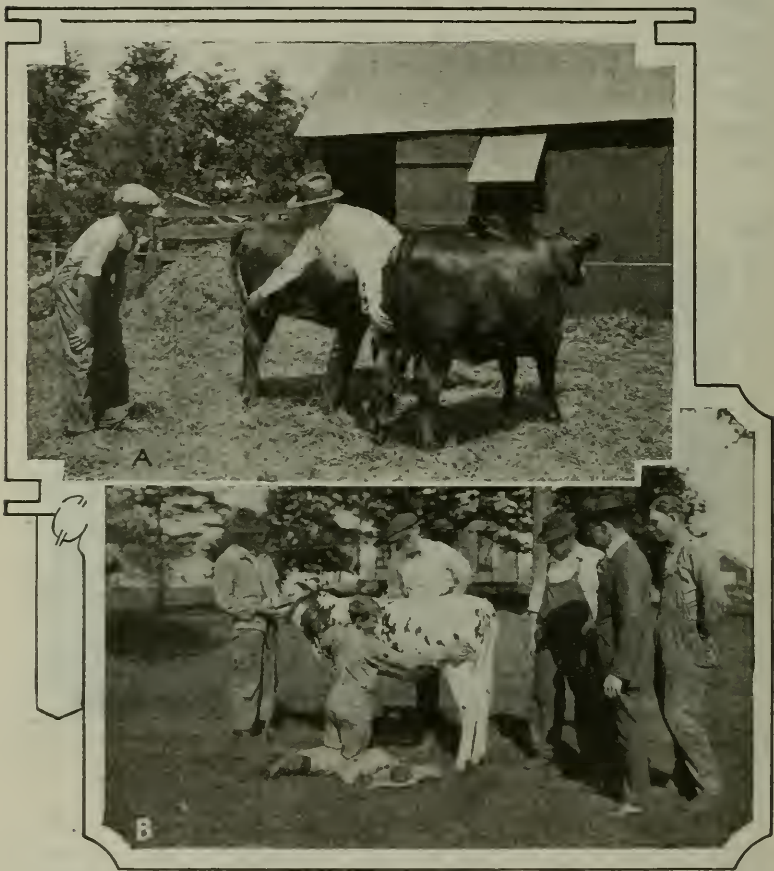
Crop production has been materially improved in many parts of the country through demonstrations carried on by club members. Corn clubs have probably had a wider influence than any other in this respect. There is evidence that the results of corn-club demonstrations are being accepted and put into practice by farmers generally in communities where the most successful demonstrations are made. R. A. Moore, corn extension specialist of the University of Wisconsin, states that he is convinced that the high yield of corn in recent years in Wisconsin, as compared with several other corn States, is due largely to the fact that boys' and girls' club members in that State have for 10 years been producing high-grade seed and distributing it to farmers throughout the State. One corn-club boy in Minnesota, although he is only 16, has developed a regular seed-corn business, has built and owns a fine seed-corn house, and expects to sell this year 500 bushels of seed corn. For several years corn-club members in Colorado have been making demonstrations in corn growing and have been selling seed from registered fields, with the result that there has been a marked

A Demonstration in Corn Growing.

improvement in corn production. It is reported that Colorado farmers are willing to pay practically twice as much for registered seed grown by club members as for ordinary seed corn.

The First Purebred on the Farm.

In introducing purebred live stock into communities where scrubs have largely prevailed, and in weeding out unprofitable animals from the farm herds, as well as in improving methods of feeding and caring for stock, the club members have accomplished some notable results. Thousands of purebred animals have been introduced as a result of the club work with baby beeves, dairy animals, sheep, and swine. Some 33,000 club members are now engaged in such work in the Northern and Western States.



A, Learning How to Judge as Well as Feed; *B*, Preparing for the Show.

Of 174 entries by club members at the Iowa State Fair in the baby-beef class, 121 were sold at auction and 2 by private sale. The 123 calves weighed 124,220 pounds and sold at an average price of $18.30 per hundredweight. Iowa State College purchased two of the calves for $650.

Club work with dairy calves is carried on in 23 of the Northern and Western States, and has two main purposes, namely, the introduction of better stock and the demonstration of the best methods of feeding and care for maximum milk production. This has in many cases led to the general introduction in the community of systematic milk testing and keeping of records of feed and of milk production. In some instances club members as a group have brought in registered sires or joined bull circles, and in some communities members have joined or formed cow-testing associations, of which farmers generally have also become members. The introduction of better stock and better methods which has thus been brought about is laying a foundation for permanent future improvement.

In many instances the club animal has been the first purebred on the farm, and it has been the interest of the boy or girl that has won the farmer over to purebreds entirely and has made him more kindly disposed toward community movements and associations for the introduction of better stock. It is a matter of actual record that during 1920 over 5,000 farmers were led to replace scrub pigs with purebreds as a result of the pig-club work, and this figure is undoubtedly an inadequate index of the influence the club work is exerting in this direction. It is especially significant that in many communities the club members are supplying much of the purebred stock bought by the farmers.

As a result of poultry club work purebred fowls have been introduced on many farms that had previously known only scrub chickens, and thousands of unproductive fowls have been culled from the flocks. In many communities club work has been responsible for establishing the practice of raising only one breed, thus simplifying production problems and establishing a better reputation and market for the community product. In 1920, 3,000 poultry-club members in the Northern and Western States introduced 38,000 purebred fowls on their home farms, culled 1,200 flocks, and raised 155,000 chickens. Club work not only helps to keep the country boy on the farm, but even reaches out and leads the city boy back to the land. One city boy who went into the poultry-club work made such a success of it that he determined to go regularly into the business. "I owe all my success in the poultry business," he says, "and what I may accomplish in the future, largely to the boys' and girls' club work, for it has started me on the road to success."

One of the far-reaching effects of club work has been its influence in extending the practice of home canning. The farm diet has been materially improved through this important contribution to the winter food supply of the home.

A, The Garment-Making Club in Action; *B*, A Bread Club Demonstration Team.

The average cash income on the farm is relatively low, and therefore any increase in the cost of clothing becomes a heavy tax on the family budget, making home sewing increasingly necessary. In 1920, 30,000 girls in the Northern and Western States were organized in sewing clubs in which they learn not only to sew but to use commercial patterns and to select suitable fabrics. They produced 63,100 garments for themselves and for members of their families, and, in addition, more than one-third of them did all the family mending. They also organized demonstration teams, and during the year gave 897 demonstrations in garment making before 36,485 people. Through these demonstrations they created a widespread interest in home sewing and showed how simple it is. Their work convinced many mothers that what seemed to be a difficult problem was really quite easy when attacked in the right way. These teams gave style shows, demonstrating not only the proper garments for the growing girl, but the shape of shoes one should wear as well.

The Bankers Take an Interest.

Property ownership is a powerful incentive to the best effort, and creates a sense of business responsibility that is of the utmost value to the prospective citizen. A survey conducted at the International Live Stock Exposition at Chicago in 1920 showed that 253 club members taking part in demonstrations at the exposition were worth $300,000. Their average holdings were about $1,200, representing live stock, savings, and investments acquired over a period of from three to six years through strict attention to business and to the use of the best known practices. This accumulation of resources has not escaped the watchful eye of the banker, who is always ready to loan money for use in productive enterprises and to assist in community development. In 1920 the bankers of the Northern and Western States loaned $900,000 to the young business men and women of the clubs. Not a single case of a club member failing to meet his obligations in a businesslike manner has come to our attention.

Social and Community Development.

Club work not only promotes individual thrift and skill, but has also had a marked influence in the social development of the club members. Meetings, songs, yells, games, and the like, as part of the group activities of the clubs, have appealed especially to young people and have tended to increase their interest in demonstration work, as well as to promote their social development and welfare.

Parades, festivals, displays, pageantry, fairs, and games have been valuable supplementary features of club work, and have had an important influence in stimulating interest among boys and girls and in making them active club members. A realization of the importance of the work they are doing in giving public demonstrations, the organization of a definite program of work, and the keeping of accurate records and reports have done much to make young people feel that they are essential to the life of a community and are making definite contributions to its welfare. In 1920 club members held 1,736 achievement day meetings and 98 club camps, and made more than 95,500 club exhibits.

A Club Boy and His Pig.

In the Northern and Western States club work is rapidly becoming a regular feature of the county extension program, and in the organization of counties and communities for extension work the part that boys and girls can take in helping to meet the problems that arise is now generally recognized and provided for. For example, suppose that in a certain community one or more of the following problems develop: The wheat yield is low, the potato crop is unprofitable, the hens lay only one-fifth of the time, living conditions do not compare favorably with those of the city home, there is much hard work and little social life or recreation in the community, and the young men and women of the community are leaving for the city in large numbers. In planning a community program of extension work the problem of low wheat yield may be assigned to certain farmers who undertake to demonstrate the value of late fall planting and using an improved variety; other farmers take up demonstrations in the better handling of the potato crop, treating the seed for scab prevention, and cultivating the crop according to the most improved methods suggested by scientific investigation. In this connection, however, the question may arise as to whether some of the boys of the community might not be competent and willing to assist in the demonstration work, thus greatly increasing the number of demonstrations and the reliability of the results. A potato club is organized and the boys take up the demonstrational work as enthusiastically as their fathers, treating seed and practicing better methods of cultivation, spraying, and seed selection. In the same way both boys and girls are enrolled in poultry clubs to supplement the demonstrations their mothers are carrying on in profitable poultry production, and take an active part in promoting such work. Thus a foundation is laid for holding the interest of the young people in the community by establishing closer ties of interest between parents and children and uniting them in the work of solving the economic and social problems of the community as a whole.

Clubs Make a Big Place for Themselves.

Boys' and girls' club work has come to be recognized as of such consequence that in the Northern and Western States 200 counties now employ county club agents to work with the communities in developing demonstration work among young people. In such counties a budget of from $3,000 to $4,000 is appropriated to carry on the work annually. The club enrollment in these counties is from 400 to 1,000 members, and the earnings of the club work amount on an average to $40 a year per member.

The fact that in 1920 over 216,000 boys and girls between the ages of 10 and 18 years were engaged in club work and were seeking through their membership in about 14,000 local clubs to improve agricultural and home economics practices in their communities and reaching and influencing through this means over a million persons, indicates that club activities have become an important part of extension work and community life. The actual financial output of these clubs in 1920 was something over $4,600,000, which is an indication of the sound business basis upon which this work has been established. When we realize that the club

Poultry Club Members Starting Home After a Club Meeting.

membership in the Northern States which was only 23,000 in 1915 had increased to over 216,000 in 1920, some idea may be gained of the popularity of this work and of the possibilities it offers for the future.

From an economic standpoint club work has more than paid its way in actual money returns, and, in addition, has trained in leadership and broadened in social outlook hundreds and thousands of boys and girls who will soon constitute a considerable portion of the adult rural citizenship of the country and be a controlling influence in American farm life.

THE FARMER'S INTEREST IN FOREIGN MARKETS

By E. G. Montgomery, *Specialist in Foreign Markets*, and C. L. Luedtke, *Assistant in Market Information, Bureau of Markets*.

A WORLD MARKET is a comparatively reliable and stable market, since it is a broad market. Such a market is especially advantageous to the farmer, who can not vary his production to meet current needs in the same way that a manufacturing plant can. He plans from one to two years ahead, with the result that an acreage that produces enough in poor seasons yields a large surplus in good years. This variation is largely beyond his control. To meet this variation in local supply, agriculture, more than any other industry, needs a world market with all facilities in transportation, warehousing, and business organizations to move the surplus to the regions where it can be consumed. The effect of a surplus on a narrow market is illustrated by a perishable crop like peaches, which can not be given very wide distribution. A surplus in one section means as a rule low prices and often no market for at least a part of the crop.

The World Market Determines the Price.

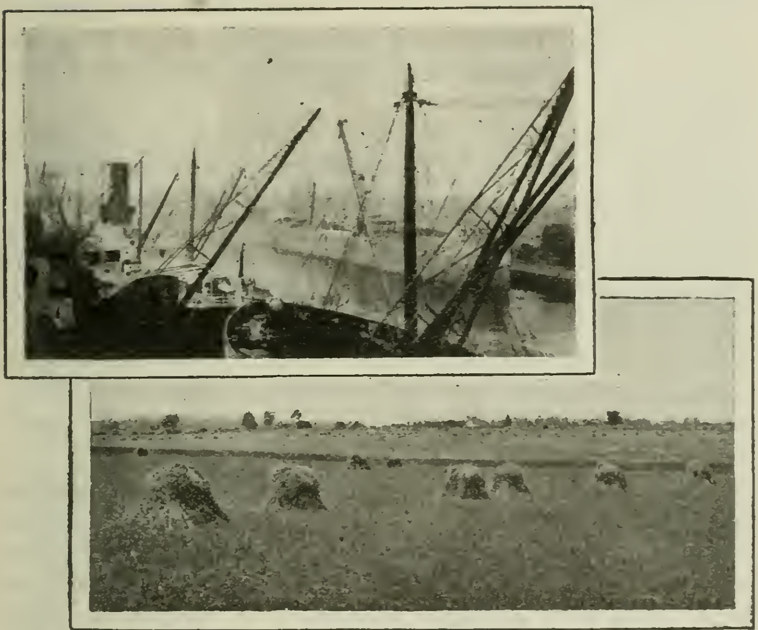
The sharp decline in the prices of grain, wool, and other agricultural commodities during the last half of 1920 has focused the attention of the country on the marketing problems of the American farmer. It has accentuated the need for a more accurate knowledge of the influences that determine the prices and movements of farm products and of how these influences may be controlled, if possible, by the producer. It has also emphasized the necessity for developing and maintaining a foreign market for our surplus farm products. The farmer is feeling the need of world-market information.

The development and maintenance of a foreign market is in a measure subject to the same influences that control domestic prices and movements of agricultural products. It is the knowledge of these influences that may be said to constitute the basis for world-trade information. Speculation thrives under uncertainty. Concentration in the hands of a few of information regarding production and consumption in all of the principal countries of the world gives the few who are informed an opportunity to speculate. The widespread knowledge of facts collected through a reliable and unbiased source reduces speculation—even makes it impossible. The producers in most countries have relied entirely upon local conditions and as a result have suffered untold losses from low prices and lack of demand for their products. A hundred years ago, with primitive methods of transportation and general dependence of each community or country on local supply, this may have been all right. To-day, however, when the wheat or cotton of Argentina or Egypt can be laid down in New York within a comparatively short time, the farmer needs to be guided not by the crop in his own township, or even county or State, but by the supply and demand in the country at large and even abroad.

A World Price Level.

The progress made during the past century in the methods of communication, transportation, and food preservation have made possible the exchange of commodities between producer and consumer removed from each other thousands of miles. The law of supply and demand has thus become world-wide in its operation and effect. As a closer study of the subject will reveal, the prices of agricultural products are controlled by a world price level in which the supply and demand for a particular commodity is reflected in the price not alone at the place where the demand is strongest but in other producing and consuming centers as well.

This is particularly true in the case of grain, where we have a price level with its base at Liverpool, which is the highest price-level point, becoming lower as you approach the producing center. The difference between the two points represents the cost of transportation and handling. If any wheat port on the Atlantic, the Baltic Sea, or the Mediterranean gets out of line 3 or 4 cents on the price of



Grain on Its Way from Western Fields to Foreign Markets.

wheat, within 24 hours or less cargoes will be diverted to that port by wireless. As on almost any day in the year there are from 30 to 80 million bushels of wheat afloat and a good part of this can be diverted by cable or wireless, the price level can be kept at a very steady point.

The same thing will be found true in the case of wool, cotton, and other commodities. The determining factor is the world supply and the world demand. It may not look that way to the farmer who is unable to reconcile low prices with poor crops in his locality, or even his entire State.

But the fact to remember is that it is not the condition of the crop in one or several States but the whole potential supply of wheat or other commodity in the world that determines the price level.

The most difficult thing to ascertain is the demand, for after all it is demand that influences and determines prices. It is what you or I or someone else will pay for lemons that finally determines the price of lemons. It is what somebody will pay for wheat that decides the price of wheat. In the long run and to a certain degree, the cost of production determines price over a period of 10. 20, or 50 years, but does not determine it in a particular year or at a particular place.

There are two kinds of price fluctuations to be considered: First, steady upward or downward trends which should correspond to changes in world price levels and are controlled in general by the world supply and demand. Some of these trends last for months, others for years. Second, short movements from day to day or week to week are influenced by domestic conditions or sudden changes in foreign countries. These short-time fluctuations are very annoying, as it is often difficult to discover any real reason for them. The long-time variations are eventually of greater importance, especially long-term periods of high or low prices.

If the general world conditions that affect supply and demand could be foreseen it would be possible to regulate stock raising or wheat production on a better basis. At present we are practically blind as to the future. A few years of fair prices may stimulate thousands of farmers to equip for live-stock raising, to be followed then by years of low prices which may mean a hard struggle, discouragement, and heavy losses.

Forecasting the World Market.

Is it possible to establish a forecast of the world market, and how? It can be done only through a thorough, continuous study of all the great producing areas and the problems that confront the producer in each community and a study of the great consuming countries of the world. At present there is only one great consuming world market. That is western Europe. All other sections of the world, like China or India, produce their own supplies or do not enter into foreign trade in grain or live stock, or else, like South America and Australasia, they produce a surplus. For such study, then, we can arrange the countries in three groups: (*a*) Consuming or importing countries; (*b*) surplus or exporting countries; and (*c*) countries that do not enter into world trade in farm products. The world price level is determined by conditions in the first two groups; that is, the amount of surplus to be exported and the demand for the surplus.

Surplus for Export.

The United States is no longer a large surplus producer of meat products. We still export some pork products, we just about consume our beef products, and we import some mutton. However, our prices are controlled by potential supplies in surplus countries that may ship meats here if our price is above that of Europe or other consuming centers. We are directly concerned by the surplus production of South America and Australasia because we are on the trade routes between these countries and Europe.

South America has a great undeveloped prairie region, varying from humid to semiarid and in about the same state of development as our own great stock region west of the Missouri River some 50 years ago. The same is true of Australia and South Africa. The rate at which these regions develop in stock raising, transportation facilities, and packing-house plants has a direct bearing on the future prices of live stock in the United States. There is also the great undeveloped region in Manchuria and Siberia, a vast prairie region, almost as large as Canada, and practically undeveloped. Our live-stock growers should have carefully prepared and regular reports on the development of these regions, considering their handicaps as well as advantages and some forecast as to their probable future. Present surpluses influence the current market and information on such surpluses should be always available.

The relative development and supply of different kinds of live stock, such as sheep, cattle, or swine, should be considered. For example, if for the next 20 years the world is likely to have large surpluses of sheep from these countries, but probably no competition in swine, owing to lack of grain feed, this should be made known as a guide in our own live-stock policy. In the same way we might find strong prospective competition for grass-fed cattle, but possibly little competition for grain-fed stock. This again would have a bearing on the kind of cattle production to be promoted in our own country. Other influencing factors come readily to mind, such as the kind of farmers in the

Loading Cotton for Export at Gulfport, Miss.

Cotton is the biggest export crop of the United States. The exports of cotton in 1920 amounted to $1,136,468,916.

surplus countries, the industrial development of the country, increasing home consumption, or the effect of wars or political policies, etc., all of which combined will influence the surplus meat production.

Some World Market Information.

While the Bureau of Markets has developed to the extent permitted by available funds an efficient market reporting service for the United States, no similar machinery for collecting foreign market information has been provided. The foreign-markets division of the bureau is endeavoring to keep in close touch with conditions abroad, in cooperation with other Government agencies engaged in the collection of foreign trade information. The work of this division is carried on principally in Washington, with an agricultural trade commissioner in London and another in Buenos Aires. The information collected is published from time to time in The Market Reporter, the official marketing publication of the Department of Agriculture. Information is also given out in the extensive correspondence conducted by the division of foreign markets.

The investigational work conducted by the division of foreign markets consists of specific studies concerning the marketing of agricultural products abroad, including grain and grain products, seeds, vegetable oils, oil cakes, live stock and meats, dairy products, fresh fruits and vegetables, honey, leaf tobacco, wool, cotton, and other textile fibers. In the prosecution of this work it is the practice to utilize to the fullest possible extent the consular agents of the Department of State, as well as the commercial attachés and trade commissioners of the Department of Commerce. In some cases especially qualified representatives have been sent to the foreign field to make first-hand studies of conditions. In 1917 a preliminary study was made of the general agricultural market conditions in Europe. This was followed by specific investigations, of which the following are typical examples:

In the latter part of 1917 a special investigator was assigned to visit the Far East to study possibilities for American fruit. During 1918 another investigator was sent to Australia and New Zealand to look into the market conditions for fruit, live stock, meat, dairy products, and wool. In the spring of 1919 an investigation was made of the livestock, meat, and dairy industries of Europe to secure the fullest possible information regarding the probable demands for American live stock, dairy products, and meats during the readjustment period. Reports of the results of these investigations have been published under the titles of "Australia and New Zealand as Markets for American Fruit," (Department Circular 145), "Markets for American Fruits in China, with Recommendations for American Shippers"

(Department Circular 146), and "Live Stock Conditions in Europe" (Separate 821, Yearbook of the Department of Agriculture, 1919).

In May, 1919, and again in June, 1920, special investigators were detailed to make a study of the possibilities of marketing American purebred live stock in South America. To aid them in promoting interest in American live stock in South America, an illustrated pamphlet was printed in Spanish and Portuguese. This pamphlet contains pertinent facts relative to American purebred live stock and will serve as an accurate guide for South Americans in forming trade contacts in the United States. A preliminary report on the

Purebred Holstein Dairy Herd.

South America is a promising field for American purebred live stock. As a result of contacts established by representatives of the Bureau of Markets, business amounting to over $400,000 was transacted up to June 30, 1920.

investigations conducted in 1919, entitled "Selling Purebred Stock to South America," was published in the 1919 Yearbook of the Department of Agriculture, and is obtainable as Yearbook Separate 818.

In May, 1919, an agricultural trade commissioner was assigned to the United Kingdom to study at first-hand the conditions in the agricultural markets of that country and to report promptly by letter or cable timely information and suggestions for the assistance of American agricultural industries and exporters. He is also making systematic studies of the markets for specific products and working in close cooperation with representatives of the Department of State and the Department of Commerce.

More Needed.

The Department of Agriculture is no doubt best qualified to collect and disseminate information on the world markets for agricultural products, since it alone possesses the requisite contact with the agricultural interests of the country. But with present facilities the department can not make anything like a complete enough job of it. The organization for collecting market information would need to be greatly expanded and ways developed of helping the farmers to apply the results. If the funds were available for these developments there are many ways in which the farmer's marketing problems could be made easier of solution. For instance, if the world wheat situation could be clearly put before him from month to month it would greatly assist him in so regulating his production and marketing as to secure a maximum return for his efforts. Accurate information would also stabilize the price, as many of the wide fluctuations are no doubt due to rumors and misinformation that should have no place in a large conservative business.

APPENDIX.

AGRICULTURAL COLLEGES IN THE UNITED STATES.[1]

College instruction in agriculture is given in the colleges and universities receiving the benefits of the acts of Congress of July 2, 1862, August 30, 1890, and March 4, 1907, which are now in operation in all the States and Territories except Alaska. The total number of these institutions is 69, of which 67 maintain courses of instruction in agriculture. In 24 States and Porto Rico and Hawaii the agricultural colleges are departments of the State universities. In 17 States separate institutions having courses in agriculture are maintained for negroes. All of the agricultural colleges for white persons and several of those for negroes offer four-year courses in agriculture and its related sciences leading to bachelor's degrees, and many provide for graduate study. About 60 of these institutions also provide special, short, or correspondence courses in the different branches of agriculture, including agronomy, horticulture, animal husbandry, poultry raising, cheese making, dairying, sugar making, rural engineering, farm mechanics, and other technical subjects. The agricultural experiment stations, with very few exceptions, are departments of the agricultural colleges. All of the colleges have extension services for conducting cooperative extension work in agriculture and home economics in accordance with the act of Congress of May 8, 1914. With a few exceptions, each of the land-grant colleges offers free tuition to residents of the State in which it is located. In the excepted cases scholarships are open to promising and energetic students, and in all opportunities are found for some to earn part of their expenses by their own labor. The expenses are from $125 to $300 for the school year.

Agricultural colleges in the United States.

State or Territory.	Name of institution.	Location.	President.
Alabama	Alabama Polytechnic Institute	Auburn	Spright Dowell.
	Agricultural School of the Tuskegee Normal and Industrial Institute.	Tuskegee Institute	R. R. Moton.[2]
	Agricultural and Mechanical College for Negroes.	Normal	W. S. Buchanan.
Arizona	College of Agriculture of the University of Arizona.	Tucson	D. W. Working.[3]
Arkansas	College of Agriculture of the University of Arkansas.	Fayetteville	Bradford Knapp.[3]
	Branch Normal College	Pine Bluff	J. G. Ish, jr.
California	College of Agriculture of the University of California.	Berkeley	T. F. Hunt.[3]
Colorado	The State Agricultural College of Colorado.	Fort Collins	C. A. Lory.
Connecticut	Connecticut Agricultural College	Storrs	C. L. Beach.
Delaware	Delaware College	Newark	Walter Hullihen.
	State College for Colored Students	Dover	W. C. Jason.
Florida	College of Agriculture of the University of Florida.	Gainesville	P. H. Rolfs.[3]
	Florida Agricultural and Mechanical College for Negroes.	Tallahassee	N. B. Young.
Georgia	Georgia State College of Agriculture	Athens	A. M. Soule.
	Georgia State Industrial College	Savannah	R. R. Wright
Hawaii	University of Hawaii	Honolulu	A. L. Dean.

[1] Including only institutions established under the land-grant act of July 2, 1862.
[2] Principal. [3] Dean.

Agricultural colleges in the United States—Continued.

State or Territory.	Name of institution.	Location.	President.
Idaho	College of Agriculture of the University of Idaho.	Moscow	E. J. Iddings.[1]
Illinois	College of Agriculture of the University of Illinois.	Urbana	E. Davenport.
Indiana	School of Agriculture of Purdue University.	La Fayette	J. H. Skinner.[1]
Iowa	Iowa State College of Agriculture and Mechanic Arts.	Ames	R. A. Pearson.
Kansas	Kansas State Agricultural College	Manhattan	W. M. Jardine.
Kentucky	The College of Agriculture of the University of Kentucky.	Lexington	T. P. Cooper.[1]
	The Kentucky Normal and Industrial Institute for Colored Persons.	Frankfort	G. P. Russell.
Louisiana	Louisiana State University and Agricultural and Mechanical College.	University Station, Baton Rouge.	T. D. Boyd.
	Southern University and Agricultural and Mechanical College of the State of Louisiana.	Scotlandville	J. S. Clark.
Maine	College of Agriculture of the University of Maine.	Orono	L. S. Merrill.[1]
Maryland	University of Maryland	College Park	A. F. Woods.
	Princess Anne Academy	Princess Anne	T. H. Kiah.[2]
Massachusetts	Massachusetts Agricultural College	Amherst	K. L. Butterfield.
	Massachusetts Institute of Technology [3]	Cambridge	Elihu Thompson.[4]
Michigan	Michigan Agricultural College	East Lansing	F. S. Kedzie.
Minnesota	Department of Agriculture of the University of Minnesota.	University Farm, St. Paul.	R. W. Thatcher.[1]
Mississippi	Mississippi Agricultural and Mechanical College.	Agricultural College.	D. C. Hull.
	Alcorn Agricultural and Mechanical College.	Alcorn	L. J. Rowan.
Missouri	College of Agriculture of the University of Missouri.	Columbia	F. B. Mumford.[1]
	School of Mines and Metallurgy of the University of Missouri.[3]	Rolla	A. L. McRae.[5]
	Lincoln Institute	Jefferson City	Clement Richardson.
Montana	Montana State College of Agriculture and Mechanic Arts.	Bozeman	Alfred Atkinson.
Nebraska	College of Agriculture of the University of Nebraska.	Lincoln	E. A. Burnett.[1]
Nevada	College of Agriculture of the University of Nevada.	Reno	Robert Stewart.[1]
New Hampshire	New Hampshire College of Agriculture and the Mechanic Arts.	Durham	R. D. Hetzel.
New Jersey	State College of Agriculture and Mechanic Arts of Rutgers College and the State University of New Jersey.	New Brunswick	W. H. S. Demarest.
New Mexico	New Mexico College of Agriculture and Mechanic Arts.	State College	R. W. Clothier.
New York	New York State College of Agriculture at Cornell University.	Ithaca	A. R. Mann.[1]
North Carolina	The North Carolina State College of Agriculture and Engineering.	West Raleigh	W. C. Riddick.
	Negro Agricultural and Technical College.	Greensboro	J. B. Dudley.
North Dakota	North Dakota Agricultural College	Agricultural College.	E. F. Ladd.
Ohio	College of Agriculture of Ohio State University.	Columbus	Alfred Vivian.[1]
Oklahoma	Oklahoma Agricultural and Mechanical College.	Stillwater	J. W. Cantwell.
	Colored Agricultural and Normal University.	Langston	J. M. Marquess.
Oregon	Oregon Agricultural College	Corvallis	W. J. Kerr.
Pennsylvania	The School of Agriculture of the Pennsylvania State College.	State College	R. L. Watts.[1]
Porto Rico	College of Agriculture and Mechanic Arts of the University of Porto Rico.	Mayaguez	C. E. Horne.[1]
Rhode Island	Rhode Island State College	Kingston	Howard Edwards.
South Carolina	The Clemson Agricultural College of South Carolina.	Clemson College	W. M. Riggs.
	State Agricultural and Mechanical College of South Carolina.	Orangeburg	R. S. Wilkinson.
South Dakota	South Dakota State College of Agriculture and Mechanic Arts.	Brookings	W. E. Johnson.
Tennessee	College of Agriculture, University of Tennessee.	Knoxville	H. A. Morgan.
	Tennessee Agricultural and Industrial State Normal School.	Nashville	W. J. Hale.

[1] Dean.
[2] Principal.
[3] Does not maintain courses in agriculture.
[4] Acting Director.
[5] Director.

Agricultural colleges in the United States—Continued.

State or Territory.	Name of institution.	Location.	President.
Texas	Agricultural and Mechanical College of Texas.	College Station	W. B. Bizzell.
	Prairie View State Normal and Industrial College.	Prairie View	J. G. Osborne.[1]
Utah	The Agricultural College of Utah	Logan	E. G. Peterson.
Vermont	College of Agriculture of the University of Vermont.	Burlington	J. L. Hills.[2]
Virginia	The Virginia Agricultural and Mechanical College and Polytechnic Institute.	Blacksburg	J. A. Burruss.
	The Hampton Normal and Agricultural Institute.	Hampton	J. E. Gregg.[1]
Washington	State College of Washington	Pullman	E. O. Holland.
West Virginia	College of Agriculture of West Virginia University.	Morgantown	J. L. Coulter.[2]
	The West Virginia Collegiate Institute	Institute	J. W. Davis.
Wisconsin	College of Agriculture of the University of Wisconsin.	Madison	H. L. Russell.[2]
Wyoming	College of Agriculture, University of Wyoming.	Laramie	A. D. Faville.[2]

[1] Principal. [2] Dean.

AGRICULTURAL EXPERIMENT STATIONS.

Alabama (College), Auburn: J. F. Duggar.
Alabama (Canebrake), Uniontown: J. M. Burgess.
Alabama (Tuskegee), Tuskegee Institute: G. W. Carver.
Alaska, Sitka (branch stations at Rampart, Kodiak, Fairbanks, and Matanuska): C. C. Georgeson.[1]
Arizona, Tucson: D. W. Working.
Arkansas, Fayetteville: Bradford Knapp.
California, Berkeley: C. M. Haring.
Colorado, Fort Collins: C. P. Gillette.
Connecticut (State), New Haven; Connecticut (Storrs), Storrs: E. H. Jenkins.
Delaware, Newark: C. A. McCue.
Florida, Gainesville: P. H. Rolfs.
Georgia, Experiment: H. P. Stuckey.
Guam[2]: C. W. Edwards.[3]
Hawaii (Federal), Honolulu: J. M. Westgate.[1]
Hawaii (Sugar Planters'), Honolulu: H. P. Agee.
Idaho, Moscow: E. J. Iddings.
Illinois, Urbana: E. Davenport.
Indiana, La Fayette: G. I. Christie.
Iowa, Ames: C. F. Curtiss.
Kansas, Manhattan: F. D. Farrell.
Kentucky, Lexington: T. P. Cooper.
Louisiana—
(State), University Station, Baton Rouge; (Sugar), Audobon Park, New Orleans; (North Louisiana), Calhoun; (Rice), Crowley: W. H. Dalrymple.
Maine, Orono: J. M. Bartlett.[4]
Maryland, College Park: J. H. Patterson.
Massachusetts, Amherst: S. B. Haskell.
Michigan, East Lansing: R. S. Shaw.
Minnesota, University Farm, St. Paul: R. W. Thatcher.
Mississippi, Agricultural College: J. R. Ricks.
Missouri (College), Columbia: F. B. Mumford.
Missouri (Fruit), Mountain Grove: F. W. Faurot.
Montana, Bozeman: F. B. Linfield.
Nebraska, Lincoln: E. A. Burnett.
Nevada, Reno: S. B. Doten.
New Hampshire, Durham: J. C. Kendall.
New Jersey (College), New Brunswick; New Jersey (State), New Brunswick: J. G. Lipman.
New Mexico, State College: Fabian Garcia.
New York (State), Geneva: W. H. Jordan.
New York (Cornell), Ithaca: A. R. Mann.
North Carolina, Raleigh and West Raleigh: B. W. Kilgore.
North Dakota, Agricultural College: P. F. Trowbridge.
Ohio, Wooster: C. E. Thorne.
Oklahoma, Stillwater: H. G. Knight.
Oregon, Corvallis: J. T. Jardine.
Pennsylvania, State College: R. L. Watts.
Pennsylvania (Institute of Animal Nutrition), State College: H. P. Armsby.
Porto Rico (Federal), Mayaguez: D. W. May.[1]
Porto Rico (Insular), Rio Piedras: E. D. Colón.
Rhode Island, Kingston: B. L. Hartwell.
South Carolina, Clemson College: H. W. Barre.
South Dakota, Brookings: J. W. Wilson.
Tennessee, Knoxville: H. A. Morgan.
Texas, College Station: B. Youngblood.
Utah, Logan: F. S. Harris.
Vermont, Burlington: J. L. Hills.
Virginia (College), Blacksburg: A. W. Drinkard, jr.
Virginia (Truck), Norfolk: T. C. Johnson.
Virgin Islands, St. Croix: Longfield Smith.[1]
Washington, Pullman: E. C. Johnson.
West Virginia, Morgantown: J. L. Coulter.
Wisconsin, Madison: H. L. Russell.
Wyoming, Laramie: A. D. Faville.

[1] Agronomist in charge.
[2] Address: Island of Guam, via San Francisco.
[3] Animal husbandman in charge.
[4] Acting director.

STATE OFFICERS IN CHARGE OF COOPERATIVE AGRICULTURAL EXTENSION WORK.

Alabama: L. N. Duncan, Alabama Polytechnic Institute, Auburn.
Arizona: W. M. Cook, College of Agriculture, University of Arizona, Tucson.
Arkansas: M. T. Payne, Southern Trust Building, Little Rock.
California: B. H. Crocheron, College of Agriculture, University of California, Berkeley.
Colorado: H. T. French, State Agricultural College of Colorado, Fort Collins.
Connecticut: H. J. Baker, Connecticut Agricultural College, Storrs.
Delaware: C. A. McCue, Delaware College, Newark.
Florida: P. H. Rolfs, College of Agriculture, University of Florida, Gainesville.
Georgia: J. Phil Campbell, Georgia State College of Agriculture, Athens.
Idaho: L. W. Fluharty, The Statehouse, Boise.
Illinois: E. Davenport, College of Agriculture, University of Illinois, Urbana.
Indiana: G. I. Christie, Purdue University, La Fayette.
Iowa: R. K. Bliss, Iowa State College of Agriculture and Mechanic Arts, Ames.
Kansas: Harry Umberger, Kansas State Agricultural College, Manhattan.
Kentucky: T. P. Cooper, College of Agriculture, University of Kentucky, Lexington.
Louisiana: W. R. Perkins, Louisiana State University and Agricultural and Mechanical College, University Station, Baton Rouge.
Maine: L. S. Merrill, College of Agriculture, University of Maine, Orono.
Maryland: T. B. Symons, University of Maryland, College Park.
Massachusetts: J. D. Willard, Massachusetts Agricultural College, Amherst.
Michigan: R. J. Baldwin, Michigan Agricultural College, East Lansing.
Minnesota: A. D. Wilson, Department of Agriculture, University of Minnesota, University Farm, St. Paul.
Mississippi: R. S. Wilson, Mississippi Agricultural and Mechanical College, Agricultural College.
Missouri: P. H. Ross,[1] College of Agriculture, University of Missouri, Columbia.
Montana: F. S. Cooley, Montana State College of Agriculture and Mechanic Arts, Bozeman.
Nebraska: W. H. Brokaw, College of Agriculture, University of Nebraska, Lincoln.
Nevada: C. A. Norcross, College of Agriculture, University of Nevada, Reno.
New Hampshire: J. C. Kendall, New Hampshire College of Agriculture and the Mechanic Arts, Durham.
New Jersey: L. A. Clinton, Rutgers College and the State University of New Jersey, New Brunswick.
New Mexico: C. F. Monroe, New Mexico College of Agriculture and Mechanic Arts, State College.
New York: A. R. Mann, New York State College of Agriculture, Ithaca.
North Carolina: B. W. Kilgore, North Carolina State College of Agriculture and Engineering, West Raleigh.
North Dakota: G. W. Randlett, North Dakota Agricultural College, Agricultural College.
Ohio: H. C. Ramsower, College of Agriculture, Ohio State University, Columbus.
Oklahoma: J. A. Wilson, Oklahoma Agricultural and Mechanical College, Stillwater.
Oregon: P. V. Maris, Oregon Agricultural College, Corvallis.
Pennsylvania: M. S. McDowell, Pennsylvania State College, State College.
Rhode Island: A. E. Stene, Rhode Island State College, Kingston.
South Carolina: W. W. Long, Clemson Agricultural College of South Carolina, Clemson College.
South Dakota: W. F. Kumlein,[1] South Dakota State College, Brookings.
Tennessee: C. A. Keffer, College of Agriculture, University of Tennessee, Knoxville.
Texas: T. O. Walton, Agricultural and Mechanical College of Texas, College Station.
Utah: R. J. Evans, Agricultural College of Utah, Logan.
Vermont: Thomas Bradlee, University of Vermont and State Agricultural College, Burlington.
Virginia: J. R. Hutcheson, Virginia Polytechnic Institute, Blacksburg.
Washington: S. B. Nelson, State College of Washington, Pullman.
West Virginia: N. T. Frame, College of Agriculture, West Virginia University, Morgantown.
Wisconsin: H. L. Russell, College of Agriculture, University of Wisconsin, Madison.
Wyoming: A. E. Bowman, College of Agriculture, University of Wyoming, Laramie.

STATE OFFICIALS IN CHARGE OF AGRICULTURE.

Alabama: Commissioner of Agriculture, Montgomery.
Arizona: Dean, College of Agriculture, Tucson.
Arkansas: Commissioner of Bureau of Mines, Manufactures, and Agriculture, Little Rock.
California: Director of Agriculture, Sacramento.
Colorado: Commissioner, Colorado State Board of Immigration, Denver.
Connecticut: President, State Board of Agriculture, Hartford.
Delaware: President, State Board of Agriculture, Dover.
Florida: Commissioner of Agriculture, Tallahassee.
Georgia: Commissioner of Agriculture, Atlanta.
Idaho: Commissioner of Agriculture, Boise.
Illinois: Director of Department of Agriculture, Springfield.
Indiana: President, State Board of Agriculture, Indianapolis.
Iowa: President, Department of Agriculture, Des Moines.
Kansas: President, State Board of Agriculture, Topeka.
Kentucky: Commissioner of Agriculture, Frankfort.
Louisiana: Commissioner of Agriculture and Immigration, Baton Rouge.
Maine: Commissioner of Agriculture, Augusta.
Maryland: Executive offices, State Board of Agriculture, Kensington.
Massachusetts: Commissioner of Agriculture, Boston.
Michigan: President, Michigan Agricultural College, East Lansing.
Minnesota: Commissioner of Agriculture, St. Paul.
Mississippi: Commissioner of Agriculture and Commerce, Jackson.
Missouri: President, State Board of Agriculture, Jefferson City.
Montana: Commissioner of Agriculture and Publicity, Helena.
Nebraska: Secretary, Department of Agriculture, Lincoln.
Nevada: Dean, College of Agriculture, Reno.
New Hampshire: Commissioner of Agriculture, Concord.
New Jersey: Secretary of Department of Agriculture, Trenton.
New Mexico: President, New Mexico College of Agriculture and Mechanic Arts, State College.
New York: Commissioner of Agriculture, Albany.
North Carolina: Commissioner of Agriculture, Raleigh.
North Dakota: Commissioner of Agriculture and Labor, Bismarck.
Ohio: Secretary of Agriculture, Columbus.

[1] Acting director.

Oklahoma: President, State Board of Agriculture, Oklahoma City.
Oregon: President, Oregon Agricultural College, Corvallis.
Pennsylvania: Secretary of Agriculture, Harrisburg.
Rhode Island: Secretary of State Board of Agriculture, Providence.
South Carolina: Commissioner of Agriculture, Commerce, and Industries, Columbia.
South Dakota: Commissioner of Immigration, Pierre.
Tennessee: Commissioner of Agriculture, Nashville.
Texas: Commissioner of Agriculture, Austin.
Utah: President, Agricultural College of Utah, Logan.
Vermont: Commissioner of Agriculture, Montpelier.
Virginia: Commissioner of Agriculture and Immigration, Richmond.
Washington: Commissioner of Agriculture, Olympia.
West Virginia: Commissioner of Agriculture, Charleston.
Wisconsin: Commissioner of Agriculture, Madison.
Wyoming: Commissioner of Immigration, Cheyenne.

STATE FORESTRY DEPARTMENTS, FORESTRY EXTENSION SPECIALISTS, AND FOREST SCHOOLS, TO WHICH INQUIRIES SHOULD BE MADE CONCERNING THE HANDLING OF FARM WOODLAND PROBLEMS IN THE RESPECTIVE STATES.

State.	Office or officer, and address.
Alabama	State commissioner of Conservation, Montgomery, Ala.
California	State forester, Sacramento, Calif.
Colorado	State forester, Fort Collins, Colo.
Connecticut	State forester, New Haven, Conn.
Georgia	Forestry department, Georgia State College of Agriculture, Athens, Ga.
Idaho	University of Idaho School of Forestry, Moscow, Idaho.
Indiana	State forester, Indianapolis, Ind.
Iowa	State forestry commission, Des Moines, Iowa.
	Forestry department, Iowa State College of Agriculture, Ames, Iowa.
Kansas	State forester, Manhattan, Kans.[1]
Kentucky	Commissioner of agriculture, labor, and statistics, Frankfort, Ky.[1]
Louisiana	Superintendent of forestry, conservation commission, New Orleans, La.
Maine	Forestry department, University of Maine, Orono, Me.[1]
Maryland	State forester, Baltimore, Md.[1]
Massachusetts	State forester, Boston, Mass.[1]
Michigan	Forestry department, Michigan Agricultural College, East Lansing, Mich.[1]
Minnesota	State forester, St. Paul, Minn.
Missouri	Professor of forestry, University of Missouri, Columbia, Mo.
Montana	University of Montana, School of Forestry, Missoula, Mont.
New Hampshire	State forester, Concord, N. H.[1]
New Jersey	State forester, Trenton, N. J.
New York	Superintendent of forests, conservation commission, Albany, N. Y.[1]
North Carolina	Forester, State geological and economic survey, Chapel Hill, N. C.
	Forest extension specialist, North Carolina College of Agriculture and Mechanic Arts, West Raleigh, N. C.
North Dakota	State forester, Bottineau, N. Dak.[1]
Ohio	State forester, Wooster, Ohio.[1]
Oregon	Oregon Agricultural College, School of Forestry, Corvallis, Oreg.
Pennsylvania	Commissioner of forestry, Harrisburg, Pa.[1]
Rhode Island	Commissioner of forestry, Chepachet, R. I.
Tennessee	Forester, State geological survey, Nashville, Tenn.
Texas	State forester, College Station, Tex.
Vermont	Chief forester, Montpelier, Vt.[1]
Virginia	State forester, University, Va.[1]
Washington	State College of Washington, Pullman, Wash.
	University of Washington, Seattle, Wash.
Wisconsin	Conservation commission, Madison, Wis.[1]

[1] Planting stock distributed free or practically at cost to residents of the State.

LIVE-STOCK ASSOCIATIONS.

NATIONAL LIVE-STOCK ASSOCIATIONS.

Name of association.	President.	Address.	Secretary.	Address.
American National Livestock Association	John B. Kendrick	Sheridan, Wyo.	T. W. Tomlinson	Cooper Building, Denver, Colo.
National Association of Swine Records	E. C. Stone	409 Wisconsin Avenue, Peoria, Ill.	A. R. Simpson	609 Transportation Building, Chicago, Ill.
National Dairy Union	N. P. Hull	Lansing, Mich.		
National Mohair Growers' Association	R. E. Taylor	Carlsbad, N. Mex.	A. C. Gage	627 Board of Trade Building, Portland, Oreg.
National Swine Growers' Association	Fred H. Moore	Rochester, Ind.	W. J. Carmichael	37 West Van Buren Street, Chicago, Ill.
National Wool Growers' Association	F. J. Hagenbarth	Salt Lake City, Utah.	F. R. Marshall	Salt Lake City, Utah.
Horse Association of America	W. S. Dunham	Wayne, Ill.	Wayne Dinsmore	Union Stock Yards, Chicago, Ill.
American Remount Association	R. H. Williams, jr.	1 Broadway, N. Y.	A. A. Cedawold	Washington, D. C.
National Association of Stallion Registration Boards	C. W. McCampbell	Manhattan, Kans.	Dr. C. W. Gay	Ohio State University, Columbus, Ohio.
American Trotting Register Association	J. C. Welty	Canton, Ohio.	W. H. Gocher	1020 Main Street, Hartford, Conn.
National Association of Purebred Societies	W. S. Corsa	White Hall, Ill.		

NATIONAL LIVE-STOCK REGISTRY ASSOCIATIONS.

CATTLE.

Name of association.	President.	Address.	Secretary.	Address.
American Aberdeen-Angus Breeders' Association	L. A. Campbell	Utica, Minn.	Chas. Gray	817 Exchange Avenue, Chicago, Ill.
American Devon Cattle Club	W. H. Neal	Meredith, N. H.	Richard Pattee	51 Cornhill, Boston, Mass.
American Galloway Breeders' Association	E. J. Guilbert	Wallace, Kans.	R. W. Brown	Carrollton, Mo.
American Guernsey Cattle Club	Robt. Scoville	Taconic, Conn.	Wm. H. Caldwell	Peterboro, N. H.
American Hereford Cattle Breeders' Association	W. L. Yost	Lees Summit, Mo.	R. J. Kinzer	Eleventh and Central Streets, Kansas City, Mo.
American Jersey Cattle Club	M. D. Munn	Pioneer Press Building, St. Paul, Minn.	R. M. Gow	324 West Twenty-third Street, New York.
American Kerry and Dexter Cattle Club			C. S. Plumb	Columbus, Ohio.
American Polled Hereford Breeders' Association			B. O. Gammon	Des Moines, Iowa.
American Polled Shorthorn Breeders' Association	H. R. Williams	Grand View, Iowa	J. H. Martz	Greenville, Ohio.
American Shorthorn Breeders' Association	H. O. Weaver	Wapello, Iowa	P. K. Groves	13 Dexter Park Avenue, Chicago, Ill.
Brown Swiss Cattle Breeders' Association	Wm. B. Hale	Aqueduct Building, Rochester, N. Y.	Ira Inman	Beloit, Wis.
Dutch Belted Cattle Association of America	C. S. Mellen	Stockbridge, Mass.	E. J. Kirby	Covert, Mich.
Holstein-Friesian Association of America	D. D. Aitken	Flint, Mich.	Frederick L. Houghton	Brattleboro, Vt.
Milking Shorthorn Society			Roy A. Cook	Independence, Iowa.
Ayrshire Breeders' Association	W. P. Schanck	Avon, N. Y.	J. G. Watson	Brandon, Vt.
Red Polled Cattle Club of America	Chas. Graff	Bancroft, Nebr., R. D. 2	H. A. Martin	Richland Center, Wis.

HORSES.

American Association of Importers and Breeders of Belgian Draft Horses.			J. D. Conner, jr.	Wabash, Ind.
American Breeders' and Importers' Percheron Registry Co.			J. A. Forney	Plainfield, Ohio.
American Breeders' Association of Jacks and Jennets			J. W. Jones	Columbia, Tenn.
American Hackney Horse Society			G. C. Gue	460 Fulton Avenue, Hampstead, Long Island, N. Y.
American Clydesdale Association	W. L. Houser	Mondovi, Wis.	R. B. Ogilvie,	842 Exchange Avenue, Union Stock Yards, Chicago, Ill.
American Morgan Register Association			C. C. Stillman	3-E-44a Street, New York.
American Shetland Pony Club	T. S. Simpson	Downers Grove, Ill	Miss J. M. Wade	La Fayette, Ind.
American Saddle Horse Breeders' Association			Roger H. Lillard	Louisville, Ky.
American Shire Horse Association	J. G. Truman	Bushnell, Ill	W. G. Lynch	Tonica, Ill.
American Suffolk Horse Association	Samuel Insull	72 West Adams Street, Chicago, Ill.	R. P. Stericker	72 West Adams Street, Chicago, Ill.
American Trotting Register Association			Frank E. Best	137 South Ashland Avenue, Chicago, Ill.
Arabian Horse Club of America	W. R. Brown	Berlin, N. H	H. S. Nielson	Darien, Conn.
Cleveland Bay Society of America	Geo. R. Brown	Aurora, Ill	R. P. Stericker	72 West Adams Street, Chicago, Ill.
French Coach Horse Society of America	W. S. Dunham	Wayne, Ill	D. E. Willett	1124 Harrison Street, Oak Park, Ill.
German Hanoverian and Oldenburg Coach Horse Association of America.			J. Crouch	La Fayette, Ind.
Jockey Club (The)	Chairman, August Belmont.	18 East Forty-first Street, New York city.	Sec.-Treas., W. H. Rowe.	18 East Forty-first Street, New York city.
National French Draft Horse Association	J. W. Craft	Pekin, Ill	C. E. Stubbs	Fairfield, Iowa.
Percheron Society of America	E. B. White	Leesburg, Va.	Ellis McFarland	Union Stock Yards, Chicago.
Standard Jack and Jennet Registry of America			Wm. E. Morton	Kansas City, Mo.
Welsh Pony and Cob Society of America	John Alexander	Aurora, Ill	Julia M. Wade	La Fayette, Ind.

SWINE.

American Berkshire Association	W. S. Corsa	White Hall, Ill	Frank S. Springer	510 East Monroe Street, Springfield, Ill.
American Duroc-Jersey Swine Breeders' Association	W. H. Peacock	Cochran, Ga	Robt. J. Evans	817 Exchange Avenue, Chicago, Ill.
American Essex Swine Association			F. M. Srout	New London, Iowa.
American Hampshire Swine Record Association	R. C. Pollard	Nehawka, Nebr	E. C. Stone	409 Wisconsin Avenue, Peoria, Ill.
American Large Black Pig Society			W. T. Benton	Box 296, Lexington, Ky.
American Mule-foot Hog Record Co.			R. E. Pfeiffer	1105 Wyandotte Building, Columbus, Ohio.
American Poland China Record Association	P. W. Young	Peoria, Ill	W. M. McFadden	609 Transportation Building, Chicago, Ill.
American Tamworth Swine Record Association	F. M. Hartzell	Carthage, Ill	E. N. Ball	Hamburg, Mich.
American Yorkshire Club	B. F. Davidson	Menlo, Iowa	Harry G. Krum	471 North Fairview Avenue, White Bear Lake, Minn.
Cheshire Swine Breeders' Association			E. S. Hill	Freeville, N. Y.
Chester White Record Association	F. A. Fowler	Harpster, Ohio	F. F. Moore	Rochester, Ind.
Improved Small Yorkshire Club of America			F. B. Stewart	Espyville, Pa.
Kentucky Red Berkshire Association			W. B. Turley	Richmond, Ky.
National Chester White Record Association	Bruce R. Vale	Bonaparte, Iowa	L. B. Walter	West Chester, Pa.

LIVE-STOCK ASSOCIATIONS—Continued.

NATIONAL LIVE-STOCK REGISTRY ASSOCIATIONS—Continued.

SWINE—Continued.

Name of association.	President.	Address.	Secretary.	Address.
National Duroc-Jersey Record Association	M. W. Putman	Tecumseh, Nebr.	J. R. Pfander	Peoria, Ill.
National Poland China Record Association	J. H. Lackey	Jamestown, Ohio	A. M. Brown	Moorman Block, Winchester, Ind.
National Spotted Poland-China Association	H. L. Faulkner	Jamesport, Mo.	F. L. Obenchain	Indianapolis, Ind.
O. I. C. Swine Breeders' Association	A. M. Foster	Rushville, Ill	Sec.-Treas., O. C. Vernon.	Goshen, Ind.
Standard Poland-China Record Association	Frank Ridgeway	Blanchard, Iowa	F. L. Garrett	Maryville, Mo.
U. S. Small Yorkshire Association			D. T. Boscom	Montgomery, Mich.
Victoria Swine Breeders' Association			H. Davis	Dyer, Ind.

SHEEP.

Name of association.	President.	Address.	Secretary.	Address.
American Cheviot Sheep Society	W. T. Hyde	25 Broad St., N. Y. City	Edw. A. Stanford	Chester Hill, Pa.
American Corriedale Association	F. S. King	Cheyenne, Wyo	W. C. Bond	Box 218, Cheyenne, Wyo.
American Cotswold Registry Association			F. W. Harding	Wheaton, Ill.
American and Delaine-Merino Record Association			Gowdy Williamson	Xenia, Ohio.
American Hampshire Sheep Association	Robt. Blastock	Versailles, Ky	Comfort A. Tyler	72 Woodland Ave., Detroit, Mich.
American Leicester Breeders' Association	Wm. Whitelaw	Guelph, Ontario	A. J. Temple	Cameron, Ill.
American Oxford Down Record Association			W. A. Shafor	Hamilton, Ohio.
American Rambouillet Sheep Breeders' Association	Frank R. Cock	Bellefourche, S. Dak	Dwight Lincoln	Marysville, Ohio.
American Romney Breeders' Association			Mark Havenhill	Monticello, Ark.
American Shropshire Registry Association			Miss Julia Wade	La Fayette, Ind.
American Southdown Breeders' Association	R. P. Hite	Gallatin, Tenn	Frank S. Springer	510E. Monroe St., Springfield, Ill.
American Tunis Sheep Breeders' Association	Frank Hartman	Bainbridge, Ind	Raymond Hays	Bainbridge, Ind.
Continental Dorset Club	H. H. Cherry	Xenia, Ohio	Edith Chidester	Mechanicsburg, Ohio.
National Lincoln Sheep Breeders' Association	Graham Walker	Chazy, N. Y	Bert Smith	Charlotte, Mich.

GOATS.

Name of association.	President.	Address.	Secretary.	Address.
American Angora Goat Breeders' Association	Robt. Davis	Rio Frio, Tex	C. E. De Groff	Reeds Spring, Mo.
American Milch Goat Record Association	F. E. Dawley	Fayetteville, N. Y	W. L. TeWalt	Vincennes, Ind.
International Nubian Breeders' Association			Archie C. Talboy	La Jolla, Calif.

NATIONAL POULTRY ORGANIZATIONS.

Name of association.	Secretary.	Address.
American Poultry Association	Mrs. E. B. Campbell	319 Citizens Trust Building, Fort Wayne, Ind.
American Incubator Manufacturers' Association	P. L. Coatsworth	Care Queen Incubator Co., Lincoln, Nebr.
International Baby Chick Association	Fred H. Thayer	Baltimore, Md.

SPECIALTY POULTRY CLUBS.

Name of association.	Secretary.	Address.
American Barred Plymouth Rock Club.	F. G. Cook	Waltham, Mass.
American Black Leghorn Club	Albert Brust, jr	822 Harrison Avenue, Scranton, Pa.
American Black Orpington Club.	Ora Overholser	Mechanicsville, Md.
American Buckeye Club	E. F. Trimble	Benton, Ky.
American Buff Leghorn Club	Geo. S. Barnes	Battle Creek, Mich.
American Buff Plymouth Rock Club.	Jas. H. Hertz	Hanover, Pa.
American Buff Wyandotte Club.	J. H. Clark	West Pawlet, Vt.
American Buttercup Club	R. J. Lalone	Potsdam, N. Y.
American Cornish Club	Fred H. Bohrer	Utica, N. Y.
American Game Bantam Club	J. K. Brokaw	Somerville, N. J.
American Guinea Club	Edward R. Flint	Flintdell Farm, Tunbridge, Vt.
American Houdan Club	Nora L. Ryan	Penn Yan, N. Y.
American Java Association	Seth W. Morton	P. O. box 124, Albany, N. Y.
American Light Brahma Club	Harvey C. Wood	Boundbrook, N. J.
American Polish Fowl Club	Hiram W. Schriver	Groton, Conn.
American Rose Comb White Leghorn Club.	J. M. Chase	Wallkill, N. Y.
American Single Comb Brown Leghorn Club.	G. S. Korell	Station B, Columbus, Ohio.
American Single Comb White Minorca Club.	G. G. Truman	Perrysville, Ohio.
American White Orpington Club.	J. I. Lysle	Plainfield, N. J.
American White Plymouth Rock Club.	Wm. A. Halback	Waterford, Wis.
National American Dominique Club.	C. W. Besse	Jefferson, Me.
National Bantam Association	J. Hart Welch	Douglaston, Long Island, N. Y.
National Black Langshan Club	H. A. Reasner	R. R. G, Indianapolis, Ind.
National Bronze Turkey Club	Chas. E. Bird	Meyersdale, Pa.
National Columbian Wyandotte Club.	Levi A. Ayres	Granville, N. Y.
National Game Club	E. J. W. Dietz	736 Cornelia Avenue, Chicago, Ill.
National Partridge Wyandotte Club.	T. W. Schoen	Grosse Pointe, Mich.
National Rose Comb Orpington Club.	E. M. Mengel	Auburn, Pa.
National Bourbon Red Turkey Club.	Mrs. Minnie M. B. Brown.	Appleton City, Mo.
National Single Comb Buff Orpington Club.	I. Brook Clark	Meriden, Conn.
National Single Comb White Leghorn Club.	A. F. Rolf	R. F. D. Metairie, New Orleans, La.
National White Wyandotte Club.	E. B. Rose	East Stroudsburg, Pa.
International Black Wyandotte Club.	Ralph Roudebush	Arcadia, Ind.
International Partridge Plymouth Rock Club.	Roy E. Sutton	Minneapolis, Kans.
International S. C. Black Minorca Club.	H. S. G. McCartney.	Hall of Records, Los Angeles, Calif.
International Silver Penciled Wyandotte Club.	Fred F. Field, jr	Montello, Mass.
International Turkey Club	Mrs. Rea E. Fowler	Rochelle, Ill.
Blue Andalusian Club of America	Walter J. Coates	East Calais, Vt.
Buff Minorca Club	Walter C. Young	R. 16, Dayton, Ohio.
Buff Minorca Club of America	Wm. P. Williams.	1102 West Fifty-second Street, Los Angeles, Calif.
Hamburg Fanciers' Club	Robert C. Morse	19 Congress Street, Boston, Mass.
Rhode Island Red Club of America.	W. H. Card	Manchester, Conn.
Rhode Island White Club of America.	M. E. Bemis	Box 1376, Phoenix, Ariz.
Silver Wyandotte Club of America.	Carl H. Sommer	Rush City, Minn.
United Ancona Club	R. W. Van Hoesen	Franklinville, N. Y.
Waterfowl Club of America	Stanley Mason	Albrightsville, Pa.

LIVE-STOCK ASSOCIATIONS—Continued.

INTERSTATE LIVE-STOCK ASSOCIATIONS.

Name of association.	President.	Address.	Secretary.	Address.
Atlantic Hereford Cattle Breeders' Association	Walter Sonell	Camden, S. C	L. W. Hill	Locust Dale, Va.
Central Shorthorn Breeders' Association	L. B. Ogden	Maryville, Mo	J. A. Forsythe	Pleasant Hill, Mo.
Chicago Milk Producers' Association			W. J. Kittle	29 South La Salle Street, Chicago, Ill.
Corn Belt Meat Producers' Association	A. Sykes	Ida Grove, Iowa	H. A. Wallace	Des Moines, Iowa.
Dairymen's League			Albert Manning	303 Fifth Avenue, New York City.
Eastern Berkshire Congress	Percy D. Elliott	Greenwich, Conn	Wm. H. McKee	Pittsfield, Mass.
Eastern Guernsey Breeders' Association	Lowell Gable	Landenburg, Pa	M. M. Hollingsworth	Landenburg, Pa.
Eastern States Duroc-Jersey Association			R. N. Shaw	Springfield, Mass.
Farmers' Cooperative Live-Stock Commission Co	C. H. Gustafson	Omaha, Nebr		
Improved Stock Breeders' Association of Kansas and Oklahoma.	J. R. Roberts	Renfrow, Okla	Joseph R. Ebert	Caldwell, Kans.
Interstate Hereford Breeders' Association	M. R. Miller	Thunder Hawk, S. Dak	Chas. Bigham	Haynes, N. Dak.
Interstate Milk Producers' Association	F. P. Willits	Ward, Pa		
Interstate Shorthorn Breeders' Association	H. E. DeVries	Hull, Iowa	J. E. Halsey	505 Eleventh Street, Sioux City, Iowa.
Interstate Shorthorn Breeders' Association	J. R. Young	Richards, Mo		
Interstate Swine Breeders' Protective Association			E. F. Lowry	Ottumwa, Iowa.
Mississippi-Alabama Jersey Cattle Club			J. R. Moore	Meridian, Miss.
Missouri-Kansas Milk Producers' Association	J. B. Dillingham	Platte City, Mo	E. F. Adams	Kansas City, Mo.
Missouri Valley Duroc Breeders' Association			Dwight Putnam	Tecumseh, Nebr.
Missouri-Yellowstone Stock Breeders' Association			John Shaw	Williston, N. Dak.
New England Ayrshire Club	H. M. Kimball	Concord, N. H	R. M. Handy	Barre, Mass.
New England Devon Breeders' Association	John E. Gifford	Rockville, Conn	Leslie Geer	315 Pearl Street, Hartford, Conn.
New England Hereford Breeders' Association	Harvey D. Eaton	Waterville, Me	Stephen J. Adams	Cornish, Me.
New England Holstein-Friesian Club	H. S. Cheney	Southbridge, Mass	Winifred M. Carrigon	Concord, Mass.
New England Milk Producers' Association	Frank S. Adams		Gen. mgr., Richard Pattee.	51 Cornhill, Boston.
New England Shorthorn Breeders' Association	David Barnard	Shelbourne, Mass	W. A. Simpson	Lyndonville, Vt.
Northern Illinois and Southern Wisconsin Holstein Breeders' Association.	G. F. Baumister	Freeport, Ill		
Northern Minnesota and Northern Wisconsin Guernsey Breeders' Association.	Theo. Hollister	Duluth, Minn	W. P. Hicken	Floodwood, Minn.
Northwest Live Stock Association			E. E. Flood	Rosalia, Wash.
Northwest Shorthorn Association	A. D. Dunn	Wapato, Wash	E. L. Potter	Corvallis, Oreg.
Northwest Stallion and Jack Owners' Association			E. E. Dept	Connell, Wash.
Northwestern Live Stock Association	Geo. A. Pierson	South St. Paul, Minn		
Pacific Coast Hereford Breeders' Association	J. I. Cazier	Wells, Nev	J. A. Bunting	Mission San Jose, Calif.
Pacific Coast Trotting Horse Breeders' Association	I. L. Borden	417 Montgomery Street, San Francisco, Calif.	F. W. Kelley	Belvedere, Calif.
Texas and Southwestern Cattle Raiser's Association	W. W. Turney	El Paso, Tex	E. B. Spiller	Fort Worth, Tex.
Queen City Milk Producers' Association	P. B. Weissinger	Shelbyville, Ky		
Red River Valley Live Stock Association			C. G. Selvig	Crookston, Minn.
Rio Grande Valley Dairy Association			Edm. B. Link	Las Cruces, N. Mex.
Southeastern Guernsey Breeders' Association	R. M. Cooper, jr	Wisacky, S. C	C. T. Rice	Oakton, Va.
Southern Cattlemen's Association	Dr. J. T. Kinard	Ninety Six, S. C	E. R. Lloyd	Memphis, Tenn.

Southern Swine Growers' Association	F. J. Parham	Union, S. C	Will M. Traer	Jacksonville, Fla.
Southwestern Berkshire Congress			G. A. Stingle	San Gabriel, Calf.
Southwest Jersey Cattle Breeders' Association	M. L. Gallcday	Holden, Mo	Robt. W. Barr	Independence, Mo.
Southwestern Polled Hereford Breeders' Association			Horace Baker	Claude, Tex.
Tri-State Grain and Stock Growers' Association	C. B. Waldron	Agricultural College, N. Dak.	W. C. Palmer	Agricultural College, N. Dak.
Tri-State Hereford Association	Mark J. Woodhull	Angola, Ind.	J. W. Learned	Hamilton, Ind.
Tri-State Holstein Club	Arnold Stone	Woodstock, Conn	Miss L. W. Babcock	Dudley, Mass.
Tri-State Live Stock Association	F. H. Rowe	Camden, Mich	F. E. McConnell	Allen, Mich.
Tri-State Poultry Association	H. H. Marsh	Wheeling, W. Va	Thos. S. Meek	Wheeling, W. Va.
Tri-State Sheep Breeders' and Wool Growers' Association.	Alex Hamilton		Chas. Crothers	Taylorstown, Pa.
Twin Cities Milk Producers' Association			K. A. Kirkpatrick	Minneapolis, Minn.
Utah-Wyoming Cattlemen's Association	Chas. B. Myers	Knight, Wyo	Reuel Walton	Evanston, Wyo.
Western Tennessee and Kentucky Shorthorn Breeders' Association.			J. B. Carpenter	Dyersburg, Tenn.
Western Aberdeen-Angus Breeders' Association			R. R. Lucore	Arriba, Colo.
Western Chester White Breeders' Association			Mrs. L. Yore	East Auburn, Colo.
Western Dairy Instructors' Association	G. L. Martin	State College, Bozeman, Mont.	E. G. Woodward	Dairy Department, State College, Pullman, Wash.
Western Galloway Breeders' Association			G. E. Clark	2301 Van Buren Street, Topeka, Kans.

STATE LIVE-STOCK ASSOCIATION.

ALABAMA.

Alabama Aberdeen-Angus Breeders' Association			Francis Coleman	Suggsville.
Alabama Hereford Cattle Breeders' Association	J. E. Dunaway	Orville	R. J. Goode, jr	Gastonburg.
Alabama Jersey Cattle Club			D. M. Rencher	Uniontown.
Alabama Live Stock Association			Geo. S. Templeton	Mobile.
Alabama Shorthorn Breeders' Association	T. J. Derbey	Ward	M. C. Crabb	Gallion.
Alabama Swine Growers' and Marketing Association	C. E. Thomas	Prattville	J. C. Ford	Auburn.
Central Alabama Dairy Association			R. B. Glass	R. I. Montgomery.
Live Stock Sanitary Board	R. F. Kolb	Commissioner of Agriculture, Montgomery.	Dr. C. A. Cary	Auburn.
Southern Alabama Shorthorn Breeders' Association	V. D. Smith	Eutaw	Morton Crabb	Gallion.
Southern Shorthorn Breeders' Association			Thornton J. Wood	Troy.

ARIZONA.

Arizona Angora Goat Growers' Association	Aubrey Gist	Skull Valley		
Arizona Goat Raisers' Association	T. L. Morris	Kirkland	Aubrey Gist	Skull Valley.
Arizona Cattle Growers' Association			F. E. Schneider	Phoenix.
Arizona Dairymen's Association	F. R. Sanders	Phoenix	W. S. Cunningham	Tucson.
Arizona Holstein Breeders' Association			F. R. Sanders	Mesa.
Arizona Wool Growers' Association	Hugh E. Campbell	Flagstaff	F. W. Perkins	Flagstaff.
Navajo and Apache Cattle Growers' Association			R. R. Turbeville	Holbrook.

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

ARKANSAS.

Name of association.	President.	Address.	Secretary.	Address.
Arkansas Angus Breeders' Association			R. L. Block	Wynn.
Arkansas Hereford Breeders' Association			D. F. S. Galloway	Little Rock.
Arkansas Jersey Cattle Association			C. E. Bragg, acting	Route 3, Little Rock.
Arkansas Poland-China Breeders' Association			Hartwell Greeson	Prescott.
Arkansas Shorthorn Breeders' Association			Conway Scott	Scott.
Arkansas State Live Stock Growers' Association			R. M. Gow	Little Rock
Arkansas Swine Breeders' Association			Wm. Bruce	Brinkley.
Northwest Arkansas Shorthorn Breeders' Association			Art. T. Lewis	Fayetteville.

CALIFORNIA.

Name of association.	President.	Address.	Secretary.	Address.
Associated Dairymen of California	J. M. Henderson	Sacramento		
California Cattlemen's Association	Fred Bixby	Long Beach	D. J. Stollery	222 Sharon Building, San Francisco.
California Draft Horse Breeders' Association			R. P. Royce	Davis.
California Guernsey Club	W. J. Hidgon	Tulare	D. O. Brant	Owensmouth.
California Holstein-Friesian Association	Harry V. Bridgeford	Knightsen	Chas. L. Hughes	211 Ochsner Building, Sacramento.
California Jersey Breeders' Association	J. E. Thorp	Berkeley	V. C. Bryant	Berkeley.
California State Livestock Association			F. J. Sinclair	San Francisco.
California Swine Breeders' Association	C. B. Cunningham	Mills	J. I. Thompson	University Farm, Davis.
California Wool Growers' Association	F. A. Ellenwood	Red Bluff		
Central Stockmen's Association			W. S. Everts	San Luis Obispo.
North California Guernsey Cattle Club	B. E. Nixon	Napa	A. J. Welsh	Redwood City.
Pacific Coast Trotting Horse Breeders' Association	I. L. Borden	417 Montgomery Street, San Francisco.	F. W. Kelley	Belvedere.
Stallion Registration Board		Sacramento		
State Dairy Bureau	M. T. Freitas	San Rafael	F. W. Andreason	16 California Street, San Francisco.
Western Berkshire Congress			J. Francis O'Connor	Santa Rosa.

COLORADO.

Name of association.	President.	Address.	Secretary.	Address.
Cattle and Horse Protective Association	John E. Painter	Roggan	Frank K. Watkins	1525 Wazee Street, Denver.
Colorado Duroc-Jersey Breeders' Association	Judson Solomon	Olathe	C. F. Burke	Siloam Star Route, Pueblo.
Colorado Guernsey Breeders' Club	Clark Bender	Berthoud	Donald M. Stone	207 West Abriendo Avenue, Pueblo.
Colorado Holstein-Friesian Club	Mrs. Dorothy Douglas	Kendrick	Mrs. Storrs Hall	1200 West Alameda, Denver.
Colorado Jersey Breeders' Association	A. M. McClenahan	Greeley	Geo. E. Morton	Fort Collins.

Colorado Live Stock Association			John Graham	Broomfield.
Colorado State Dairymen's Association	W. T. Letford	Johnstown	Roud McCann	521 Chamber of Commerce Bldg., Denver.
Colorado State Federation of Cooperative Live Stock Shippers.			E. J. Trosper	906 Royal Insurance Building, Chicago.
Colorado Stockgrowers' Association			Percy Houts	613-614 Denham Building, Denver.
Colorado Swine Breeders' Association	Carl W. Henry	Greeley	Robert B. Broad	Fort Collins.
Poland-China Breeders' Association	A. D. McGillvray	Boulder	J. T. Tingle	Hooper.
Snake River Cattle Growers' Association of Colorado			E. W. Reader	Dixon, Wyo.
Stallion Registration, State Board of Stock Inspection		Denver		
Western Hereford Breeders' Association	John E. Painter	Roggan		
Western Shorthorn Breeders' Association	A. S. Cornforth	Elbert	R. D. Warnock	Route 2, Loveland.

CONNECTICUT.

Commissioner on Domestic Animals	Commissioner James M. Whittlesey.	State Capitol, Hartford		
Connecticut Berkshire Association	R. L. Faux	Niantic	Geo. L. Grant	Taftville.
Connecticut Dairymen's Association	Robert Mitchell	Southbury	D. J. Minor	Bristol.
Connecticut Guernsey Breeders' Association	Rollin S. Woodruff	Guilford	Walter Cook	Litchfield.
Connecticut Jersey Breeders' Association			C. H. Savage	Storrs.
Connecticut Sheep Breeders' Association	Henry Dorrance	Plainfield	H. L. Garrigus	Do.
Connecticut State Ayrshire Breeders' Club	Wilson H. Lee	Orange	Leonard H. Healy	North Woodstock.
Holstein-Friesian Breeders' Association of Connecticut	Robert E. Buell	Wallingford	Frederick M. Peasly	Cheshire.

DELAWARE.

Delaware Holstein-Friesian Breeders' Association	D. O. Hastings	900 Market Street, Wilmington	J. R. Danks	Winterthur.
State Live Stock Sanitary Board			Dr. H. P. Eves	301 West Eighteenth Street, Wilmington.

FLORIDA.

Cattle Raisers' Association of Florida	C. A. Carson, jr	Kissimmee	Sec.-Treas., F. N. Burt.	De Leon Springs.
Florida Aberdeen-Angus Breeders' Association	L. K. Edwards	Irvine	J. B. Simonton	Micanopy.
Florida Dairy Association	A. R. Nielson	West Palm Beach		
Florida State Swine Growers' Association	Burdette Loomis, jr	Pierce	Wm. M. Traer	Jacksonville.

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

Name of association.	President.	Address.	Secretary.	Address.
GEORGIA.				
Georgia Berkshire Association	C. J. Hardman	Commerce	Ruohs Pyron	Cartersville.
Georgia Breeders' Association	J. E. Hite	Sylvester	R. R. Childs	Athens.
Georgia Dairy and Live Stock Association	A. S. Chamblee	Bartow	Milton P. Jarnagin	Do.
Georgia Duroc Association	J. W. Hodge	Elko	J. P. Peacock	Cochran.
Georgia Hereford Cattle Breeders' Association	John D. Little	Third National Bank Building, Atlanta.	H. P. Redwine	Fayetteville.
Georgia Milk Producers' Association	H. D. Moore	Conley	P. V. Hall	Decatur.
Georgia Shorthorn Breeders' Association	J. F. Jackson	Savannah	T. G. Chastain	Atlanta.
Georgia Swine Growers' Association	W. C. Wallace	Lagrange	W. T. McArthur, jr	Ailey.
IDAHO.				
Caribou Stock Growers' Association			G. C. Gray	Montpelier.
Idaho Cattle and Horse Growers' Association	J. H. Fayle	Dubois	L. E. Dillingham	Mackay.
Idaho Livestock Association	E. J. Iddings	Moscow		
Idaho State Dairymen's Association	Gustave Kunze	Buhl	F. R. Cammack	State House, Boise.
Idaho State Live Stock Association	D. R. Hubbard	Kuna	E. F. Rinehart	Boise.
Idaho State Poland-China Association	A. L. Wilson	Greenleaf	A. J. Miller	Caldwell.
Idaho Wool Growers' Association	Hugh Sproat	Boise	John Ridenbaugh	Boise.
Northwest Live Stock Association	T. F. Wren	Fenn	O. P. Hendershot	Lewiston.
Southern Idaho Hereford Breeders' Association	H. F. Deardorf	Malta	A. G. Shades	Churchill.
Stallion Registration	State Live Stock Sanitary Board.	Boise		
ILLINOIS.				
Illinois Aberdeen-Angus Association	Simon E. Lantz	Congerville	Ray M. Hamilton	Good Hope.
Illinois Brown Swiss Cattle Breeders' Association			Chester Starr	Pekin.
Illinois Cattle Breeders' Association	W. W. Wright	Toulon	J. R. Jones	Williamsville.
Illinois Cattle Feeders' Association	H. P. Rusk	Urbana	J. W. Kirkton	
Illinois Chester White Swine Breeders' Association	Guy Smith	Little York	H. G. Andrews	Sheffield.
Illinois Duroc Swine Breeders' Association	W. H. Van Meter	Williamsville	A. Y. Bartholomew	Peoria.
Illinois Hampshire Swine Breeders	T. A. Flenner	Ashmore	Sec.-Treas. Simon Albrecht.	Tiskilwa.
Illinois Holstein-Friesian Association	Howard C. Barker	Lisle	Geo. A. Fox	Sycamore.

Illinois Horse Breeders' Association	R. C. Raboln	Clifton	J. L. Edmonds	University of Illinois, Urbana.
Illinois Jack, Jennet, and Mule Breeders' Association	Ira Sharp	Sharpsburg	A. F. Hughes	Williamsville.
Illinois Jersey Cattle Club	Carelton Trimble	Trimble	Sidney B. Smith	Decatur.
Illinois Live Stock Breeders' Association			A. P. Peters	Peoria.
Illinois Live Stock Shippers' Association	John Miller	Galva		
Illinois Percheron Breeders' Association	C. J. Raboin	Clifton	J. L. Edmonds	Urbana.
Illinois Polled Hereford Breeders' Association			L. H. Piepenbrink	Joliet.
Illinois Sheep Breeders' Association	R. J. Stone	Stonington	W. C. Coffey	Urbana.
Illinois Shorthorn Breeders' Association	R. C. Forbes	Henry	C. J. McMaster	Altona.
Illinois State Dairymen's Association	J. P. Mason	Elgin	Geo. W. Caven	136 W. Lake St., Chicago.
Illinois State Hereford Breeders' Association	A. N. Abbott	Morrison	H. P. Rusk	Urbana.
Illinois Swine Breeders' Association	F. E. Drury	University of Illinois, Urbana.	Prof. J. B. Rice	University of Illinois, Urbana, Ill.
Milk Producers' Protective Association			Jas. P. Greer	Ashland Block, Chicago.
Northern Illinois Hereford Breeders' Association	Carl Baie	Waterman	H. J. Heeg	Hinkley.
Southern Illinois Milk Producers' Association (St. Louis District).			H. J. Schultz	Shipman.
Stallion Registration Board		Springfield		
State Live Stock Association of Illinois	John Imboden	Decatur	Edw. F. Keefer	Union Stock Yards, Chicago.

INDIANA.

Indiana Aberdeen-Angus Breeders' Association	E. M. Wilson	Anderson	C. F. Gobble	La Fayette.
Indiana Ayrshire Breeders' Association	H. E. McCartney	Martinsville	L. W. Hart	Valparaiso.
Indiana Berkshire Association	R. M. Jenkins	Orleans	B. N. Stevens	Salem.
Indiana Cattle Feeders' Association	C. C. Fisher	Union City	F. G. King	La Fayette.
Indiana Chester White Breeders' Association	W. Earle Frost	Greenfield	W. E. Harton	Rushville.
Indiana Draft Horse Breeders' Association	J. V. Painter	Middletown	J. H. Skinner	La Fayette.
Indiana Duroc Swine Breeders' Association	Geo. O. Bartley	Switz City	E. K. Morris	Indianapolis.
Indiana Guernsey Breeders' Association	E. L. Jones	Warren	R. R. McNagny	Columbia City.
Indiana Hampshire Swine Breeders' Association	Geo. G. Wharton	Marion	Seth F. Hadley	Hadley.
Indiana Hereford Breeders' Association	Frank Fox	Indianapolis	H. E. Allen	Purdue University, La Fayette.
Indiana Holstein-Friesian Breeders' Association	Tom Keene	Hobart	H. A. Moss	Centerpoint.
Indiana Jersey Cattle Club	J. A. Driscoll	Liberty	C. Earl Smith	Indianapolis.
Indiana Live Stock Breeders' Association	E. J. Barker	Thorntown	F. G. King	La Fayette.
Indiana Polled Hereford Breeders' Association			F. A. Stimson	Hartford City.
Indiana Sheep Breeders' and Feeders' Association	J. C. Andrew	Westpoint	H. E. Allen	1931 Broadway, Indianapolis.
Indiana State Cooperative Live Stock Shipping Association.				Fort Wayne.
Indiana State Dairy Association	B. H. Scranton	Rising Sun	C. R. George	Purdue University, La Fayette.
Indiana State Guernsey Breeders' Association	Perry Crane	Lebanon	R. R. McNagny	Columbia City.
Indiana State Poland China Breeders' Association	R. G. East	Shelbyville	Thomas D. Kelsay	Converse.
Indiana Shorthorn Breeders' Association	A. E. Harlan	Alexandria	F. C. Beall	West La Fayette.
Indiana Swine Breeders' Association	Fred L. Obenchain	Bainbridge	Jas. R. Moore	Rochester.
Stallion Registration Board		La Fayette		

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

IOWA.

Name of association.	President.	Address.	Secretary.	Address.
Iowa Aberdeen-Angus Breeders' Association			E. T. Davis	Iowa City.
Iowa Beef Producers' Association	W. B. Seeley	Mount Pleasant	E. B. Thomas	Audubon.
Iowa Butter Makers' Association			A. W. Rudnick	Ames.
Iowa Chester Breeders' Association	C. C. Evans	North English	Jas. R. Moore	Rochester.
Iowa Draft Horse Breeders' Association	Wm. Crownover	Hudson	G. E. O'Brien	Des Moines.
Iowa Federation of Cooperative Live Stock Shippers	Knute Espe	Ames		
Iowa Fleece Wool Growers' Association	W. W. Latta	Logan	Tom C. Stone	Ames.
Iowa Guernsey Breeders' Association	H. J. Schmidt	Cedar Falls	Albert L. Hyzer	Storm Lake.
Iowa Hampshire Swine Breeders' Association	F. W. Timmerman	West Liberty	J. C. Silver	Stockport.
Iowa Hereford Cattle Breeders' Association	R. W. Cassidy	Whiting	A. D. Wiese	Manning.
Iowa Holstein-Friesian Breeders' Association	J. F. Cass	Waterloo	C. F. Jenness	Terminal Building, Waterloo.
Iowa Polled Hereford Breeders' Association	N. M. Leonard	Waukee	J. E. Kirstein	Clarion.
Iowa Sheep Breeders' and Wool Growers' Association	V. N. Casaday	Troy	V. G. Warner	Bloomfield.
Iowa Shorthorn Breeders' Association			E. R. Silliman	Colo.
Iowa Shropshire Association	Carlos Fawcett	Springdale	M. G. Thornburg	Ames.
Iowa State Dairy and Food Commissioner	W. D. Barney	Des Moines		
Iowa Swine Breeders' Association	R. W. Halford	Manning	M. P. Hancher	Rolfe.
North Central Iowa Butter Makers' Association			Frank Brunner	Route 1, Charles City.
Northwestern Iowa Polled Hereford Breeders' Assn			H. P. Tonsfeldt	Le Mars.
Stallion Registration	Dept. of Agriculture	Des Moines		

KANSAS.

Name of association.	President.	Address.	Secretary.	Address.
Aberdeen-Angus Association of Kansas	E. L. Barrier	Eureka	Johnson Workman	Russell.
Chester White Swine Breeders' Association of Kansas	J. L. Darst	Huron	Arthur Mosse	Herington.
Holstein-Friesian Breeders' Association of Kansas	Walter A. Smith	Topeka	W. H. Mott	Manhattan.
Kansas Ayrshire Breeders' Association	H. H. Hoffman	Abilene	Jas. W. Linn	Do.
Kansas Duroc Breeders' Association	G. M. Shepherd	Lyons	W. W. Jones	Beloit.
Kansas Hampshire Swine Breeders' Association	F. B. Wempe	Frankfort	Geo. W. Ela	Valley Falls.
Kansas Hereford Breeders' Association	J. O. Southard	Comiskey	E. D. George	Council Grove.
Kansas Horse Breeders' Association	D. F. McAlister	Topeka	F. W. Bell	Manhattan.
Kansas Improved Stock Breeders			I. D. Graham	2201 West Sixth Avenue, Topeka.
Kansas Jersey Cattle Club			F. W. Atkeson	Manhattan.
Kansas Live Stock Association	J. R. Plumb	Emporia	J. H. Mercer	State House, Topeka.
Kansas Poland-China Breeders' Association	F. B. Caldwell	Topeka	Paul Olivier	Danville.
Kansas Sheep and Wool Growers' Association	A. L. Stockwell	Larned	A. M. Paterson	Manhattan.
Kansas State Dairy Association	Geo. Lenhert	Abilene	W. E. Peterson	Do.
Kansas Swine Breeders' Association	Fred B. Caldwell	Topeka	E. F. Ferrin	Do.
Northern Kansas Hereford Breeders	Wm. Acker	Vermillion	C. G. Steele	Barnes.
Stallion Registration: Live Stock Registry Board		Manhattan		
State Dairy Commissioner	H. M. Jones	do		

KENTUCKY.

Holstein-Friesian Club of Kentucky	J. S. Lindsay	Winchester	Clarence B. Smith	Crestwood.
Kentucky Beef Cattle Association	C. H. Boyer	Lexington	E. S. Good	Experiment Station, Lexington.
Kentucky Chester White Breeders' Association	Chas. E. Tanner	Erlanger	W. T. Duvall	Pewee Valley.
Kentucky Dairy Cattle Club	Harry Hartke	do	J. J. Hooper	Lexington.
Kentucky Hereford Breeders' Association	E. H. Taylor	Frankfort	H. O. Moxley	Shelbyville.
Kentucky Horse, Mule and Jack Stock Breeders' Association.	M. S. Cohen	do	W. S. Anderson	Lexington, R. R. S.
Kentucky Purebred Live Stock Association	C. E. Marvin	Paynes Depot	L. B. Shropshire	604 Republic Building, Louisville.
Kentucky Red Berkshire Association			W. B. Tarley	Richmond.
Kentucky Sheep Breeders' Association	R. H. Stevenson	Lexington	E. S. Good	Experiment Station, Lexington.
Kentucky Shorthorn Breeders' Association	C. H. Bower	do	R. T. Judy	Sharpsburg.
Kentucky Swine Breeders' Association			Hubert Vreeland	Farmers' Home Journal, Louisville.
Kentucky Trotting Horse Breeders' Association of Lexington.	Ed. A. Tipton	Lexington	J. W. Williams	Lexington.
Saddle Horse Breeders' Association			I. B. Ball	Louisville.

LOUISIANA.

Beef Cattle Breeders' Association of Louisiana	John Cockerham	Luella	C. C. Chapman	De Ridder.
Live Stock Breeders' Association of Louisiana	do	do		
Louisiana Dairymen's Association	A. W. Wallace	Kentwood	I. S. West	Baton Rouge.
Louisiana Hereford Breeders' Association	J. Bob Daniel	St. Francisville	E. L. Jordan	Do.
Louisiana Holstein-Friesian Breeders' Association	E. Sundberry	Napoleonville	C. H. Staples	University Station, Baton Rouge.
Louisiana Jersey Breeders' Association	C. M. Roberts	Minden	H. R. Easterbrook	Alexandria.
Louisiana Shorthorn Breeders' Association	G. C. Chapman	De Ridder		
Louisiana State Live Stock and Breeders' Association			R. B. Bentley, acting	University Station, Baton Rouge.
Louisiana Swine Breeders' Association	O. P. Geren	Common Street, New Orleans	J. B. Francioni, jr	Baton Rouge.
State Live Stock Sanitary Board			Dr. E. P. Flower	

MAINE.

Maine Ayrshire Breeders' Association	E. W. Files	Portland	John A. Ness	Auburn.
Maine Dairymen's Association	John A. Ness	Auburn	H. M. Tucker	Department of Agriculture, Augusta.
Maine Holstein-Friesian Breeders' Association	C. L. Pike	Lubec	Harold J. Shaw	Sanford.
Maine Live Stock Breeders' Association	Myron Peabody	South Portland	Edward W. Morton	221 Woodford Street, Woodfords.
Maine Sheep and Wool Growers' Association	W. J. Thompson	South China	C. H. Crawford	Augusta.
Maine Shorthorn Breeders' Association	C. I. Gilbert	Greene		
Maine State Guernsey Breeders' Association	W. M. Dingley	Gardiner	Geo. S. Smith	Monmouth.
Maine State Jersey Breeders' Association			J. H. Moore	Winthrop.

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

MARYLAND.

Name of association.	President.	Address.	Secretary.	Address.
Holstein-Friesian Breeders' Club of Maryland	John M. Dennis	Lutherville	G. H. Hibbard	Lutherville.
Jersey Cattle Breeders' Association			C. E. Lloyd	Forest Hill.
Maryland Sheep Growers' Association	Charles Wertheimer	Frederick	E. B. Bomberger, secretary-treasurer.	College Park.
Maryland State Dairymen's Association	D. G. Harry	Pylesville	I. W. Heaps	Fidelity Building, Baltimore.

MASSACHUSETTS.

Name of association.	President.	Address.	Secretary.	Address.
Massachusetts Cattle Owners' Association			J. L. Harrington	Lunenburg.
Massachusetts Creamerymen's Association	W. A. Harlow	Cunnington	W. P. B. Lockwood	Amherst.
Massachusetts Dairymen's Association	G. F. E. Storey	Worcester	do	Do.
Massachusetts Guernsey Breeders' Association	F. Lothrop Ames	North Easton	Richard G. Harwood	Littleton.
Massachusetts Swine Breeders' Association	H. C. Barton	South Amherst	V. A. Rice	Amherst.
State Dairy Bureau	P. M. Harwood, general agent.	Room 136, Statehouse, Boston.		

MICHIGAN.

Name of association.	President.	Address.	Secretary.	Address.
Central Michigan Holstein Breeders' Association	Fred R. McDonel	Lansing	J. F. Dexter	R. F. D., Lansing.
Central Michigan Shorthorn Breeders' Association			Oscar Skinner	R. 1, Gowen.
Improved Black-Top Merino Sheep Breeders' Association.	C. F. Klecker	Oak Grove	O. M. Robertson, secretary-treasurer.	Eaton Rapids.
Michigan Aberdeen-Angus Breeders' Association	Alexander Minty	Ionia	Ward Hathaway	Ovid.
Michigan Berkshire Breeders' Association	J. L. Miller	Caledonia	B. B. Perry	Leslie.
Michigan Dairymen's Association	R. F. Frary	Lapeer	Martin Seidel	Bay City.
Michigan Duroc-Jersey Swine Breeders' Association	O. F. Foster	Pavilion	J. B. Miller	Ithaca.
Michigan Federation of Cooperative Live Stock Shippers.	Manager, C. E. Compson.	Remus	L. E. Willet	
Michigan Guernsey Breeders' Association	E. J. Smallidge	Eau Claire	Earl Hemingway	Sodus.
Michigan Hereford Breeders' Association	Jay Harwood	Ionia	Earl C. McCarty	R. 7, Bad Axe.
Michigan Holstein-Friesian Association	H. W. Norton, jr	East Lansing	A. Jenkins	Lansing.
Michigan Horse Breeders' Association	Jacob DeGens	Alicia	R. S. Hudson	East Lansing.
Michigan Improved Live Stock Breeders' and Feeders' Association.	Herbert Powell	Ionia	Geo. A. Brown	M. A. College, East Lansing.
Michigan Jersey Cattle Club	Alvin Balden	Capac	Alfred Hendrickson	Shelby.
Michigan Merino Sheep Breeders' Association	H. L. Mayo	Nashville	E. N. Ball	Hamburg.
Michigan Milk Producers' Association	N. P. Hull	Dimondale	R. C. Reed	Howell.

Michigan O. I. C. and Chester White Swine Breeders' Association.	H. T. Crandell	Cass City	J. Carl Jewett	Mason.
Michigan Poland-China Swine Breeders' Association	J. R. Hawkins	Hudson	J. K. Mayslead	Hillsdale.
Michigan Red Polled Cattle Breeders' Association	N. C. Herbison	Birmingham	E. J. Peabody	Grand Ledge.
Michigan Sheep Breeders' and Feeders' Association	E. G. Read	Richland	D. Williams	East Lansing.
Michigan Shorthorn Breeders' Association	G. A. Prescott	Tawas City	W. E. J. Edwards	Do.
Michigan Shropshire Association			W. H. Shantz	Hastings.
Michigan Oxford Down Sheep Breeders' Association	O. M. Yorke	Millington	I. R. Waterbury	Detroit.
Michigan Swine Breeders' Association	W. C. Taylor	Milan	P. P. Pope	Mount Pleasant.
Southwestern Michigan Holstein Association			A. H. Crosby	New Buffalo.
Stallion Registration Board		Richmond		

MINNESOTA.

Central Cooperative Live Stock Shipping Association of Minnesota.	H. L. Halverson	Litchfield	W. A. McKerrow	University Farm, St. Paul.
Guernsey and Holstein Breeding Association			G. A. Lundine	Route 4, Box 147, Milaca.
Minnesota Aberdeen-Angus Breeders' Association	L. A. Campbell	Utica	W. E. Morris	University Farm, St. Paul.
Minnesota Ayrshire Association	Arthur H. Barnard	Lumber Exchange, Minneapolis.	Geo. J. Chambers	Owatonna.
Minnesota Brown Swiss Cattle Breeders' Association			Lucius F. Brunold	R. 5, Rochester.
Minnesota Cattle Breeders' Association	J. S. Montgomery	Owatonna	Frank E. Millard	Canby.
Minnesota Chester White Breeders' Association	H. A. Derenthal	Wykoff	L. A. Howe	St. James.
Minnesota Cooperative Dairies' Association			Chas. A. Moore	Sauk Center.
Minnesota Creamery Operators' and Managers' Association.			Henry Sandholt	St. Paul.
Minnesota Duroc Breeders' Association	Mason W. Spicer	Minneapolis	Sec.-treas., Chas. E. Hall.	Minneapolis.
Minnesota Guernsey Breeders' Association	Geo. P. Grout	Nickerson	L. V. Wilson	University Farm, St. Paul.
Minnesota Hereford Breeders' Association	L. E. Potter	Springfield	J. S. Jones	Do.
Minnesota Holstein-Friesian Breeders' Association	E. T. Winship	Owatonna	Bertram D. Scott	Richfield Station, Minneapolis.
Minnesota Horse Breeders' Association	L. W. Orr	Hastings	J. F. Kuehn	University Farm, St. Paul.
Minnesota Jersey Cattle Club	T. T. Bachellar	Forest Lake	Geo. S. Taylor	Withrow.
Minnesota Live Stock Breeders' Association	Thos. E. Cashman	Owatonna	W. A. McKerrow	University Farm, St. Paul.
Minnesota Polled Hereford Breeders' Association			H. A. Tate	Balaton.
Minnesota Red Polled Breeders' Association	Geo. P. Grout	Nickerson	F. W. Foote	Red Wing.
Minnesota Sheep Breeders' Association	J. L. Morton	St. Cloud	P. A. Anderson	University.
Minnesota Shorthorn Breeders' Association	Clyde C. Lee	Villard	Philip S. Gordon	Morris.
Minnesota Stallion Registration Board			J. F. Kuehn	University Farm, St. Paul.
Minnesota State Cattle Breeders' Association			John B. Irwin	Station F, Minneapolis.
Minnesota State Dairy and Food Commissioner	Jas. Sorensen	Old Capitol, St. Paul		
Minnesota State Dairymen's Association			Chris Heen	Osakis.
Minnesota State Holstein-Friesian Cattle Breeders' Association.			C. A. Gaumnitz	Butler.
Minnesota State Live Stock Shippers' Association			W. A. McKerrow	University Farm, St. Paul.
Minnesota State Poland-China Breeders' Association	H. W. Van Valkenburg.	Osakis	Chas. E. Walker	Glencoe.
Minnesota Swine Breeders' Association	H. A. Derenthal	Wykoff	E. F. Ferrin	University Farm, St. Paul.

LIVE-STOCK ASSOCIATIONS—Continued

STATE LIVE-STOCK ASSOCIATIONS—Continued.

MISSISSIPPI.

Name of association.	President.	Address.	Secretary.	Address.
Mississippi Aberdeen-Angus Breeders' Association	A. Olson	Elliott	M. T. Aldrich	Michigan City.
Mississippi Cattle Feeders' and Breeders' Association.	J. R. Anderson	Flora	S. S. Jordan	Canton.
Mississippi Creamerymen's Association	J. S. Moore	Agricultural College	L. S. Edwards	Tupelo.
Mississippi Duroc Breeders' Association			J. A. Martin, jr	Hardy.
Mississippi Hereford Cattle Breeders' Association	Percy H. Anderson	Holly Springs	E. K. Middleton	Pocahontas.
Mississippi Jersey Cattle Club			E. P. Gulledge	Durant.
Mississippi Live Stock and Dairy Association	C. H. Cocke	Crawford	Archibald Smith	Natchez.
Mississippi Poland-China Association			W. L. Newton	New Albany.
Mississippi Shorthorn Breeders' Association	Roland W. Jones	Grenada	C. G. Bingham	Carrollton.
Mississippi Swine Breeders' Association			E. M. Ranck	Agricultural College.

MISSOURI.

Name of association.	President.	Address.	Secretary.	Address.
Central Shorthorn Breeders' Association			J. A. Forsythe	Pleasant Hill.
Chester Breeders' Association of Missouri	J. H. McAnaw	Cameron	Sidney D. Frost	Kingston.
Missouri Aberdeen-Angus Breeders' Association	Ernest Bacon	Poplar Bluff	J. D. Blackwell	Fayette.
Missouri Cattle, Swine, and Sheep Raisers' Association.			S. T. Simpson	Columbia.
Missouri Creamerymen's Association			L. N. Moore	Willow Springs.
Missouri Draft Horse Breeders' Association	Scott J. Miller	Chillicothe	E. A. Trowbridge	Columbia.
Missouri Duroc-Jersey Swine Breeders' Association (Inc.)	E. H. Quisenberry	Carrollton	R. L. Hill	Do.
Missouri Federation of Cooperative Live Stock Shippers.	W. W. Fuqua	Monroe City	Ralph Loomis	Do.
Missouri Hampshire Swine Association	Isom J. Martin	Kahoka	Mrs. C. I. Ward	Cameron.
Missouri Holstein Breeders' Association	C. M. Long	Sedalia	C. E. Driver	Crescent.
Missouri Jersey Breeders' Association			R. F. Tesson	Clayton.
Missouri Live Stock Producers' Association	S. P. Houston	Malta Bend	S. T. Simpson	Columbia.
Missouri O. I. C. and Chester White Swine Breeders' Association.	J. H. McAnaw	Cameron	W. W. Henderson	La Plata.
Missouri Poland-China Swine Breeders' Association	J. P. Bennett	Lees Summit	C. H. Walker	600 Graphic Arts Building, Kansas City.
Missouri Polled Hereford Breeders' Association			Firmin T. Haile	Bonne Terre.
Missouri Saddle Horse Breeders' Association			E. A. Trowbridge	Columbia.
Missouri Sheep Breeders' and Feeders' Association			(Acting) E. A. Trowbridge.	Do.
Missouri State Dairy Association	E. C. Bennett	Jefferson City	A. C. Ragsdale	Do.
Missouri State Holstein-Friesian Association	C. M. Long	Sedalia	C. E. Driver	Crescent.
Missouri Swine Growers' and Breeders' Association	G. M. Laughlin	Kirksville	L. A. Weaver	Columbia.
Northwest Missouri Hereford Breeders' Association	Jas. B. McNerney	Coin, Iowa	Howard E. French	Kellerton, Iowa.
Northwest Missouri Holstein Association	Harry Cook	Maysville	J. R. Fenner	St. Joseph.
Ozark Pure-Bred Stock Breeders' Association	"Zach." Galloway	Aurora	W. E. Cundiff	Springfield.
Southern Missouri Creamerymen's Association			L. N. Moore	Willow Springs.
Southwest Guernsey Breeders' Association	Timothy C. Bradley	Kansas City	Lloyd Champlin	1427 Cherry Street, Kansas City.

Southwest Hereford Breeders' Association	Zack Galloway	Aurora	C. B. Langston	Bower Mills.
Southwest Jersey Cattle Breeders' Association	M. L. Galloday	Holden	Robt. W. Barr	Independence.
Southwest Shorthorn Breeders' Association	J. W. McCanse	Mount Vernon	Clinton Marbut	Verona.
Stallion Registry Board		Columbia		
State Dairy Commissioner	E. G. Bennett	do		
		MONTANA.		
Montana Hereford Breeders' Association	Hal. B. Ives	Brady	L. Chatterton	Spion Kop.
Montana Horse Breeders' Association			E. H. Riley	1018 South Fifth Avenue, Bozeman.
Montana Live Stock Commission	J. H. Burke	Hogan	E. A. Phillips	Helena.
Montana Purebred Hog Breeders' Association	P. J. Meloy	Townsend	Albert R. Whitney	R. 1, Belgrade.
Montana Shorthorn Breeders' Association	C. E. Axtell	Salesville	W. W. Wheeler	Great Falls.
Montana State Dairymen's Association	F. M. Ecles	Hamilton	W. E. Tomson	Bozeman.
Montana Stock Growers' Association	Wallace Huidekoper	Wallis	D. W. Raymond	Sheridan.
Montana Wool Growers' Association			F. M. Hampton	Helena.
Stallion Registration Board		Bozeman		
State Dairy Commissioner	W. H. Fluhr	State Capitol Building, Helena.		
		NEBRASKA.		
Chester Breeders' Association of Nebraska	H. L. Bode	Friend	C. H. Murray	Friend.
Farmers' Cooperative Live Stock Commission Co.	C. H. Gustafson	Omaha		
Highline Shorthorn Breeders' Association			E. L. Godfrey	Cozad.
Nebraska Aberdeen-Angus Breeders' Association	F. J. Hoffmeister	Imperial	D. K. Robertson	Madison.
Nebraska Dairymen's Association	H. A. Morrison	Collegeview	J. E. Palm	Lindell Hotel, Lincoln.
Nebraska Farmers' Cooperative Grain and Live Stock State Association.	J. S. Canaday	Minden	E. P. Hubbard	1219 City National Bank, Omaha.
Nebraska Galloway Breeders' Association	V. W. Straub	Avoca	J. M. Lamb	Williams.
Nebraska Guernsey Breeders' Association	Ernest A. Olsen	Stromsburg	John Frazer	Bellevue.
Nebraska Hereford Breeders' Association	Glenn E. Stryker	Callaway	C. B. Berger	Callaway.
Nebraska Holstein-Friesian Breeders' Association	H. C. Langan	R. 6, Omaha	Dwight Williams	Omaha.
Nebraska Horse Breeders' Association	H. J. McLaughlin	Doniphan	H. J. Gramlich	University Farm, Lincoln.
Nebraska Improved Live Stock Breeders' Association	Charles Graff	Bancroft	do	Do.
Nebraska Jersey Cattle Breeders' Association			H. C. Young	156 South Thirty-third Street, Lincoln.
Nebraska Live Stock Feeders' Association	Z. F. Leftwich	St. Paul	K. F. Waner	University Farm, Lincoln.
Nebraska Polled Hereford Breeders' Association			Boyd C. Radford	Newark.
Nebraska Red Polled Breeders' Association	Luke Wiles	Plattsmouth	Elliott R. Davis	Lincoln.
Nebraska Sheep Breeders' Association	Charles Atkinson	Pawnee City	William H. Savin	University Farm, Lincoln.
Nebraska Shorthorn Breeders' Association	A. C. Shallenberger	Alma	C. McCarthy	R. 5, York.
Nebraska State Sheep Breeders' and Wool Growers' Association.			H. P. Pier	242 North Sixteenth Street, Lincoln.
Nebraska Stock Growers' Association	Robert Graham	Alliance	Chas. C. Jameson	Ellsworth.
Nebraska Swine Breeders' Association	Sam McKelvie	Fairfield	Elmer J. Lamb	Tecumseh.
Stallion Registration Board		Lincoln		

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

Name of association.	President.	Address.	Secretary.	Address.
NEVADA.				
Eastern Nevada Wool Growers' Association			H. J. Jones	Elko.
Nevada Live Stock Association	J. Sheehan	Winnemucca	Vernon Metcalf	307 Nixon Building, Reno.
Nevada State Sheep Commission			Stan. C. Mitchell	Reno.
Nevada State Veterinary Association			Dr. W. B. Earl	Do.
Nevada Wool Growers' Association			E. V. Metcalf	Do.
NEW HAMPSHIRE.				
Granite State Dairymen's Association	Roy D. Hunter	West Claremont	J. M. Fuller	Durham.
New Hampshire Ayrshire Cattle Breeders' Association	Hollis F. Towns	Manchester	Geo. H. Yeaton	Dover.
New Hampshire Holstein-Friesian Association	J. W. Prentiss	Alstead	C. A. Preston	Contoocook.
New Hampshire Jersey Cattle Club	Geo. M. Putnam	Contoocook	F. E. Garvin	Dunbarton.
New Hampshire Sheep Breeders' Association	W. H. Neal	Meredith	E. A. Perry	Meredith.
NEW JERSEY.				
Bureau of Creamery and Dairy Inspection	G. W. McGuire, chief	Trenton		
Holstein-Friesian Breeders' Association of New Jersey	Louis H. Schenck	Neshanic Station	Jacob Todd, jr	Somerville.
Jersey Cattle Association of New Jersey	C. R. Hires	Salem	Fred Huyler	Gladstone.
New Jersey Berkshire Breeders' Association	A. S. Knight	Bernardsville	L. E. Ortiz	Bernardsville.
New Jersey Guernsey Breeders' Association	E. T. Gill	Haddonfield	C. D. Cleveland	Eatontown.
New Jersey State Dairymen's Association	Robert V. Armstrong	Augusta	John W. Bartlett	Express Station, New Brunswick.
New Jersey State Sheep and Wool Growers' Association	Arthur G. Danks	Allamuchy	Wm. H. Hamilton	Department of Agriculture, Trenton.
New Jersey State Swine Growers' Association	C. Craig Tallman	Columbus	J. M. Hunter	Annandale.
Stallion Registration Board		New Brunswick		
NEW MEXICO.				
Eastern New Mexico Swine Growers' Association	O. M. Trotter	Artesia	W. C. Reed	Santa Fe.
New Mexico Cattle and Horse Growers' Association	T. E. Mitchell	Albert	Bertha Benson	Box 617, Albuquerque.
New Mexico Wool Growers' Association	G. M. Otero	Los Lunas	Walter M. Connell	Albuquerque.
Stallion Registration, the Cattle Sanitary Board				Do.

NEW YORK.

Cornell Dairy Students' Association	C. S. Thompson	Vernon	Herman L. Williams	Delhi.
Dairymen's League Cooperative Association (Inc.)	Bradley Fuller	Mann Bldg., Utica		
Eastern New York Holstein-Friesian Breeders' Association.	H. D. Warner	Pauling	E. J. Chaffee	Amenia.
Empire State Ayrshire Club	W. P. Schanck	Avon	Milton W. Davison	Canisteo.
Holstein-Friesian Breeders' Club of New York	H. V. Noyes	Oneida	Frank T. Price	Syracuse.
New York Chester White Breeders' Association			Sec.-treas. V. H. Todd.	Bellvale.
New York State Breeders' Association	Calvin J. Huson	Penn Yan	Albert E. Brown	18 South Lake Avenue, Albany.
New York State Dairymen's Association	Hugh Troy	College of Agriculture, Ithaca	Thos. E. Tiquin	Department of Farm and Markets, Albany.
New York State Draft Horse Breeders' Club	E. S. Akin	909 Ackerman Ave., Syracuse	E. E. Horton	Johnson City.
New York State Federation of County Sheep Growers' Cooperative Association (Inc.).	Fred Porter	Crown Point	Mark J. Smith	College of Agriculture, Ithaca.
New York State Guernsey Breeders' Association	J. R. Claney	1000 West Belden Avenue, Syracuse.	C. H. Hechler	Rosyln.
New York State Jersey Cattle Club	Harry S. Gail	East Aurora	C. O. Gould	East Hampton.
New York State Sheep Breeders' Association	J. C. Duncan	Lewiston	J. Stanley Pratt	Knowlesville.
Southwestern New York Holstein-Friesian Breeders' Association.	Benjamin Pringle	Mayville	Geo. A. Kirkland	Dewittville.
Stallion Registration	Commissioner of Agriculture.	Albany		
Western New York Milk Producers' Association			Wm. E. Dana	Avon.

NORTH CAROLINA

Carolina Aberdeen-Angus Breeders' Association			E. H. Harrison	Salisbury.
North Carolina Beef Breeders' and Feeders' Association	J. E. Lathem	Greensboro	R. S. Curtis	West Raleigh.
North Carolina Dairymen's Association	D. J. Lybrook	Winston-Salem	J. A. Arey	Do.
North Carolina Hereford Breeders' Association	B. B. Miller	Mount Ulla	J. H. Rogers	Roxboro.
North Carolina Jersey Cattle Club			J. C. McNutt	West Raleigh.
North Carolina Live Stock and Dairy Association			Dan T. Gray	Department of Agriculture, Raleigh.
North Carolina State Guernsey Breeders' Association	F. H. Beall	Linwood	T. D. Brown	Salisbury.
North Carolina Swine Breeders' Association	W. W. Shay	West Raleigh	Dan T. Gray	West Raleigh.
State Sheep Breeders' Association			Geo. Evans	Do.
Western North Carolina Sheep Breeders' Association			P. E. Fogle	Beaver Creek.

NORTH DAKOTA.

North Dakota Aberdeen-Angus Breeders' Association	Livy Johnson	Cogswell	E. J. Thompson	Agricultural College, Fargo.
North Dakota Dairymen's Association			J. J. Osterhous	Bismarck.
North Dakota Farmers' Cattle Co	Ira Scroggins	Bismarck		
North Dakota Hereford Breeders' Association	John Mills	Hannaford	B. H. Critchfield	Fargo.

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

NORTH DAKOTA—Continued.

Name of association.	President.	Address.	Secretary.	Address.
North Dakota Holstein-Friesian Breeding Circuit	Chas. Klusman	Youngstown	Fred Michaels	Youngstown.
North Dakota Jersey Cattle Breeders' Association	C. E. Batchellee	Box 213, Fingal	S. F. Crabbe	Fargo.
North Dakota Live Stock Association			Burke H. Critchfield	Fargo.
North Dakota Shorthorn Breeders' Association			W. F. LaGrange	Agricultural College.
North Dakota Stock Growers' Association	Ed Peeke	Fryburg	W. L. Richard	Dickinson.
North Dakota Yorkshire Club	L. A. Knoke	Willow City	Harry J. Devine	Mapleton.
Stallion Registration Board				Agricultural College.
United Stock Breeders' Association	W. P. Hetler	Esmond	J. C. McMillan	Esmond.

OHIO.

Name of association.	President.	Address.	Secretary.	Address.
Ohio Aberdeen-Angus Breeders' Association	O. E. Bradfute	Xenia	B. L. Thompson	Columbus.
Ohio Ayrshire Breeders' Association	E. B. McConnell	Wellington	Lawrence Betts	Wellington.
Ohio Belgian Breeders' Association	M. M. Chaffin	Galena	D. J. Kays	Columbus.
Ohio Delaine-Merino Association			(Temporary) S. M. Cleaver.	Delaware.
			(Elected) Gowdy Williamson.	Xenia.
Ohio Duroc Swine Breeders' Association	Chas. F. Sprague	Lima	C. C. Terrell	New Vienna.
Ohio Farmers' Cooperative Milk Co.	H. W. Ingersoll	Elyria		
Ohio Galloway Cattle Breeders' Association	Jas. Frantz	R. 4, Bluffton	G. D. Simmons	Hicksville.
Ohio Guernsey Breeders' Association	C. Harrington Davis	Newark	Sec.-treas. W. H. Steffens.	Sylvania.
Ohio Hampshire Swine Breeders' Association	W. C. Gilliland	Van Wert	J. W. Wuichet	Columbus.
Ohio Hereford Breeders' Association	Jas. V. Hill	Roundhead	J. B. Fernow	Leesburg.
Ohio Holstein-Friesian Association	H. B. Gooding	Tiffin	Ben. J. Studer	Orrville.
Ohio Jersey Cattle Club	Walter E. Brown	Youngstown	P. J. Cummings	Fredericktown.
Ohio Percheron Breeders' Association	W. H. Butler	Sandusky	D. J. Kays	Columbus.
Ohio Polled Hereford Breeders' Association			J. D. John	Millersport.
Ohio Rambouillet Sheep Breeders' Association	C. P. Raup	Springfield	L. C. Orth	McGuffey.
Ohio Red Poll Breeders' Association	Homer C. Price	Newark	Frank Nelson	London.
Ohio Sheep and Wool Growers' Association			J. T. Walker	Gambier.
Ohio Shorthorn Breeders' Association	J. A. Huston	Granville	W. C. Rosenberger	Tiffin.
Ohio Shropshire Breeders' Association	L. B. Palmer	Pataskala	Ralph A. Postle	Camp Chase.
Ohio State Chester White Breeders' Association	I. Cummins	Xenia	F. A. C. Schwistermann.	Montezuma.
Ohio State Dairymen's Association	H. W. Ingersoll	Elyria	Oscar Erf	Ohio State University, Columbus.
Ohio Swiss Cheese Association	Geo. Rousch	Sugarcreek	R. B. Stoltz	Columbus.

OKLAHOMA.

Farmers' Union Creamery and Produce Co.	Manager, Glen Daniell.	Pawnee		
Live Stock Producers' Association of Oklahoma			Sec.-treas. W. R. Martineau.	Oklahoma.
Oklahoma Aberdeen-Angus Breeders' Association	John Simpson	Eufaula	William Alson	Edmond.
Oklahoma Dairymen's Association	R. L. Peebly	R. No. 8, Oklahoma	C. W. Radway	Stillwater.
Oklahoma Draft Horse Association	F. A. Heberling	Ponca City	W. L. Blizzard	Do.
Oklahoma Galloway Breeders' Association	G. W. Hiersche	Geary	F. M. Outhier	Homestead.
Oklahoma Hereford Breeders' Association	J. H. Reily	Shawnee	Keith Sellars	Okarche.
Oklahoma Holstein-Friesian Cattle Breeders' Club			J. C. Pontius	Yukon.
Oklahoma Improved Stock Breeders' Association	W. H. Taggart	Waukomis	Chas. M. Johnson	Waukomis.
Oklahoma Jersey Cattle Breeders' Association	R. L. Publey	Oklahoma	A. L. Churchill	Vinita.
Oklahoma Red Polled Cattle Breeders' Association	G. W. Fyke	Konawa	Sec.-treas. W. P. Reavis	R. 1, Earlboro.
Oklahoma Sheep and Wool Growers' Association	Jas. W. Harris	Moorewood	M. A. Watkins	Clinton.
Oklahoma Shorthorn Breeders' Association			J. K. Taggart	Bison.
Do	H. T. Blake	Duncan	R. N. Brittan	Waukomis
Oklahoma Swine Breeders' Association	W. A. Williams	Marlow	S. B. Jackson	El Reno.
Oklahoma Swine Growers' Association	R. A. Welsh	Red Oak	Roy Finerty	Colcord Building, Oklahoma.
Stallion Registration, Oklahoma Live Stock Registry Board.		Stillwater		

OREGON.

Cattle and Horse Raisers' Association of Oregon	Wm. Pollman	Baker	S. O. Correll	Baker.
Farmers' Dairy Association	C. A. Bear		S. A. Riches	Turner.
Oregon Butter and Cheese Makers' Association			V. D. Chappell	Corvallis.
Oregon Dairy Council	P. M. Brandt	Corvallis	Mrs. Edith K. Hill	1008 Broadway Building, Portland.
Oregon Dairymen's Association	C. L. Hawley	McCoy	P. M. Brandt	Corvallis.
Oregon Dairymen's League	Alma D. Katz	Corbett Building, Portland	M. S. Schrock	Portland.
Oregon Goat Raisers' Association			Oran M. Nelson	Corvallis.
Oregon Guernsey Cattle Club	J. T. Whalley	Portland	Octavo Vogel	Hubbard.
Oregon Holstein Cattle Club	S. B. Hall	do	J. E. Franks	Scappoose.
Oregon Horse Breeders' Association	W. R. Ledbetter	La Grande	D. E. Richards	Corvallis.
Oregon Jersey Cattle Club	W. K. Taylor	Corvallis	S. Fine	Do.
Oregon Purebred Live Stock Association	C. L. Hawley	McCoy	N. C. Maris	35 East Ninth Street, North Portland.
Oregon Swine Breeders' Association	Thos. Brunk	Salem	G. O. Swales	Johnson, Wash.
Oregon Wool Growers' Association	J. H. Dobbin	Joseph	Mac Hoke	Enterprise.
State Dairy and Food Commissioner	J. D. Mickle	Portland		
Willamette Valley Wool Growers' Association	Sales Manager, C. L. Hawley.	Monmouth		

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

PENNSYLVANIA.

Name of association.	President.	Address.	Secretary.	Address.
Northwestern Pennsylvania Shorthorn Breeders' Association.			Alva Reynolds	Lyonsville.
Pennsylvania Berkshire Breeders' Association	W. W. Blake	Arkoll, New Hope	E. S. Deubler	Narberth.
Pennsylvania Breeders' and Dairymen's Association			E. K. Hibshman	State College.
Pennsylvania Holstein-Friesian Association	John A. Bell, jr	Pittsburgh	Howard C. Reynolds	Dalton.
Pennsylvania Jersey Breeders' Association	Horace G. Twadell	Media	A. K. Heath	Berwyn.
Pennsylvania Sheep Breeders' Association	R. L. Merrill	Washington	J. B. Henderson	Hickory.
Pennsylvania State Veterinary Medical Association			Dr. D. E. Hickman	Philadelphia.
Stallion Registration, Live Stock Sanitary Board		Harrisburg		

SOUTH CAROLINA.

Name of association.	President.	Address.	Secretary.	Address.
South Carolina Berkshire Association	B. Harris	Columbia	J. M. Moss	Cameron.
South Carolina Guernsey Breeders' Association	A. McDonald	Blackstock	R. M. Cooper, jr	Wisacky.
South Carolina Live Stock Association	R. M. Cooper, jr	Wisacky	T. O. Lawton	Garnett.

SOUTH DAKOTA.

Name of association.	President.	Address.	Secretary.	Address.
South Dakota Aberdeen-Angus Association			R. E. Hunter	Letcher.
South Dakota Cattlemen's Association			Frank M. Stewart	Buffalo Gap.
South Dakota Chester White Breeders' Association	J. M. Erion	Mitchell	C. W. Caskey	Mitchell.
South Dakota Dairymen's and Butter Makers' Association.	Chas. Anderson	Howard	A. P. Ryger	Brookings.
South Dakota Federation of Live Stock Associations	M. J. Flanagan	Selby	R. N. Cuykendall	Aberdeen.
South Dakota Hereford Breeders' Association	H. A. Hildebrand	Reliance	J. H. Sinclair	Beresford.
South Dakota Holstein-Friesian Association	C. Larsen	Brookings	T. E. Gage	Groton.
South Dakota Improved Live Stock and Poultry Breeders' Association.	M. W. Myler	Mitchell	J. C. Holmes	Brookings.
South Dakota Poland-China Breeders' Association	Geo. W. Dixon	Watertown	Chas. McCaffree	Pierre.
South Dakota Shorthorn Breeders' Association	J. E. Ziebach	Gannvalley	D. C. McMonies	Huron.
Stallion Registration (Live Stock Sanitary Board)		Pierre		
Western Stock Growers' Association	Jas. T. Craig	Bellefourche	F. M. Stewart	Buffalo Gap.

TENNESSEE.

Middle Tennessee Beef Breeders' Association	Clarence Campbell	Lynnville	J. E. Hite	Nashville.
Tennessee Aberdeen-Angus Breeders' Association				Knoxville.
Tennessee Jersey Breeders' Association	Geo. Campbell	Spring Hill	J. E. Morris	1503 Dallas Avenue, Nashville.
Tennessee Shorthorn Breeders' Association			A. D. Knox	Knoxville.

TEXAS.

Holstein-Friesian Breeders' Club of Texas	C. O. Moser	Dallas	R. L. Pou	Dallas.
Panhandle Hereford Breeders' Association	Geo. M. Boles	Lubbock	R. M. Stephens	Channing.
Pecos Valley Angora Goat Raisers' Association			Sec.-Treas., W. R. Hegler.	Frijole.
Sheep and Goat Raisers' Association of Texas			E. E. Stricklen	Juno.
Texas Aberdeen-Angus Breeders' Association	John C. Burns	College Station, A. and M. of Texas.	W. M. Hill	Christoval.
Texas Hereford Association	B. C. Rhome, jr	Fort Worth	John P. Lee	San Angelo.
Texas Jack and Mule Breeders' Association	J. W. Shephard	Plano	S. L. Greene	Celeste.
Texas Jersey Cattle Club	D. T. Simonds	Fort Worth, Box 81, R. 3	Emmett Brown	Cleburne.
Texas Live Stock Shippers' Protective League	S. B. Burnett	Fort Worth	W. E. McConnell	Fort Worth.
Texas Red Polled Cattle Club	S. W. McLarty	Vernon	J. W. Mann	Waco.
Texas Saddle Horse Breeders' Association	W. I. Yopp	Dalles	Jas. J. Miller	
Texas Shorthorn Breeders' Association	G. E. King	Taylor	John C. Burns	Stockyards Station, Fort Worth.
Texas State Dairymen's Association			R. L. Pou	College Station.
Texas State Swine Breeders' Association	Geo. P. Lillard	Arlington	R. L. Ward	Do.

UTAH.

Stallion Registration Board		Logan		
Utah Cattle and Horse Growers' Association			W. E. Carroll	Logan.
Utah Holstein Breeders' Association	C. L. Funk	Richmond	A. L. Harris	Richmond.
Utah Live Stock Breeders' Association			W. E. Carroll	Logan.
Utah State Dairymen's Association	W. C. Winder	Salt Lake City	G. B. Caine	Do.
Utah Wool Growers' Association	John W. Thornley		J. A. Hooper	Salt Lake City.
Virgin River Stockmen's Association			D. H. Morris	St. George.

LIVE-STOCK ASSOCIATIONS—Continued.

STATE LIVE-STOCK ASSOCIATIONS—Continued.

VERMONT.

Name of association.	President.	Address.	Secretary.	Address.
Vermont Ayrshire Club	G. H. Dunsmore	R. D. Swanton	Clyde N. Smith	Brandon.
Vermont Dairymen's Association			O. L. Martin	Plainfield.
Vermont Guernsey Breeders' Association	F. H. Farrington	Brandon	J. P. Ramsey	Charlotte.
Vermont Holstein-Friesian Club	G. F. Gregory	Dummerston	F. L. Parmalee	Putney.
Vermont Jersey Cattle Club	H. M. Lee	Windsor	Guy Tiffany	East Berkshire.

VIRGINIA.

Name of association.	President.	Address.	Secretary.	Address.
Holstein-Friesian Association of Virginia	J. A. Turner	Hollins	R. V. Martindale	Sweet Briar.
Rockingham Pure Bred Live Stock Association			G. F. Holsinger	McGaheysville.
Shenandoah Valley Shorthorn Breeders' Association			John C. Cather	Winchester.
Virginia Aberdeen-Angus Breeders' Association			A. F. Buchanan	Glade Springs.
Virginia Jersey Cattle Club			Frank C. Baldwin	Fredericksburg.
Virginia State Dairymen's Association	F. S. Walker	Woodberry Forest	A. F. Howard	Farmville.
Virginia State Guernsey Breeders' Association	S. C. Freeman	Oak Ridge	Frank E. Saunders	Leesburg.

WASHINGTON.

Name of association.	President.	Address.	Secretary.	Address.
Northwest Hereford Breeders' Association	J. D. Miles	Livingston	Chas. Bull	Mabton.
Stallion Registration Board		Pullman		
State Dairymen's Association			A. B. Nystrom	Pullman.
United Dairy Association of Washington	J. A. Scollard	Chehalis		
Washington Holstein Breeders' Association	Wm. Bishop	Chimacum	A. B. Winter	Everett.
Washington Live Stock Producers' Association	A. E. Dunn	Wapato	J. H. Roberts	U. S. Yards, Spokane.
Washington Pure Bred Live Stock Association	G. M. Wilson	Rocklyn	A. H. Poston	R. F. D., Spokane.
Washington State Guernsey Breeders' Association	John E. Wrage	Arlington	H. B. Douglas	Ferndale.
Washington Wool Growers' Association			T. J. Drumheller	Walla Walla.

WEST VIRGINIA.

Holstein-Friesian Association of West Virginia	J. R. Caldwell	Schmulbach Building, Wheeling.	Walter Wayman	R. 1, Wheeling.
West Virginia Ayrshire Breeders' Association			Paul O. Reymann	Wheeling.
West Virginia Hereford Breeders' Association	Howard M. Gore	Clarksburg	V. V. Law	Janelew.
West Virginia Live Stock Association	do	do	E. A. Livesay	Morgantown.
West Virginia Sheep Breeders' Association			S. C. Gist	Wellsburg.
West Virginia Sheep and Wool Growers' Association	Flavius B. Davidson	Bridgeport	Chas. E. Wheeler	Charleston.
West Virginia Shorthorn Breeders' Association	A. DeWitt Pierce	Moundsville	R. H. Tuckwiller	Lewisburg.

WISCONSIN.

Central Wisconsin Guernsey Breeders' Association	J. Ross Porter	Marshfield	A. P. Bean	Vesper.
Holstein-Friesian Breeders' Association	S. H. Bird	South Byron	J. R. Garver	Pioneer Building, Madison.
Milwaukee Milk Producers' Association			G. R. Rice	First National Bank Building, Milwaukee.
Stallion Registration, department of horse breeding		Madison		
Wisconsin Aberdeen-Angus Breeders' Association	Parke Gelbach	Lancaster	J. G. Fuller	Madison.
Wisconsin Ayrshire Breeders' Association	Stephen Bull	Racine	A. J. McNab	Black River Falls.
Wisconsin Brown Swiss Cattle Breeders' Association	M. L. Ayers	Honey Creek	B. H. Hibbard	Madison.
Wisconsin Cheese Producers' Federation	Henry Krumsey	Plymouth		
Wisconsin Chester-White Breeders' Association	James Fisher	Eastman	B. H. Babcock	Evansville.
Wisconsin Dairymen's Association	Chas. A. Peterson	Rosendale	Paul C. Burchard	Fort Atkinson.
Wisconsin Duroc-Jersey Swine Breeders' Association	M. H. O'Keefe	Waunakee	J. D. Grant	Delavan.
Wisconsin Hampshire Swine Breeders' Association	A. L. Damon	Richland Center	W. W. Meacham	Downing.
Wisconsin Hereford Cattle Breeders' Association	C. W. Thompson	Walworth	C. J. Schroeder	Racine.
Wisconsin Holstein Breeders' Association	S. H. Bird	South Byron	C. J. Schroeder	Mayville.
Wisconsin Horse Breeders' Association	J. A. Wood	Marshall	J. G. Fuller	Madison.
Wisconsin Jersey Breeders' Association	W. H. Clark	Rice Lake	Charles Peterson	Rosendale.
Wisconsin Live Stock Breeders' Association	W. L. Houser	Mondovi	Andrew W. Hopkins	Madison.
Wisconsin Poland-China Breeders' Association	F. A. Morehouse	Lancaster	Burlie Dobson	Lancaster.
Wisconsin Red Poll Breeders' Association	J. B. Ahlers	West Bend	L. C. Underwood	Avoca.
Wisconsin Sheep Breeders' Association	W. Woodard	Bloomer	W. F. Renk	Sun Prairie.
Wisconsin Shorthorn Breeders' Association	E. R. Williams	Bangor	J. L. Tormey	17 Butler Street, Madison.
Wisconsin Swine Growers' Association	L. P. Martiny	Chippewa Falls	Burlie Dobson	Lancaster.

WYOMING.

Wyoming Stock Growers' Association	J. C. Shaw	Orin	Miss Alice Smith	Cheyenne.
Wyoming Wool Growers' Association	J. M. Wilson	Douglas	J. B. Wilson	McKinley.

STATISTICS OF GRAIN CROPS, 1920.

CORN.

TABLE 1.—*Corn: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	104,229	103,435	106,197	105,296	116,730	104,467	100,072	104,601
Canada:								
Ontario	291	239	237	160	160	195	221	244
Quebec	24	17	16	13	74	55	44	48
Total Canada	315	256	253	173	234	250	265	292
Mexico	11,554	[2] 4,748	....	[2] 2,765	....	[2] 3,974	....	....
Total	116,098	....	....	....	....	....	....	....
SOUTH AMERICA.								
Argentina	8,128	10,260	10,386	9,928	8,969	8,715	9,800	8,184
Chile	56	59	80	66	49	65	65	....
Uruguay	551	692	787	697	627	590	552	495
Total	8,735	11,011	11,253	10,691	9,645	9,370	10,417	....
EUROPE.								
Austria	[3] 761	[4] 469	[5] 497	[6] 362	121	113	104	....
Hungary proper[3]	6,038	6,129	6,194	....	....	....	....	[7] 1,894
Croatia Slavonia[3]	1,036	....	....	....	....	....	....	....
Bosnia Herzegovina[3]	578	....	....	....	....	....	....	....
Bulgaria[3]	1,544	1,571	1,579	1,342	1,385	1,455	[7] 1,392	[7] 1,419
Czecho-Slovakia	....	....	....	....	....	....	[8] 36	292
France[3]	1,155	1,128	935	812	847	754	736	792
Italy	3,931	3,894	3,887	3,918	3,853	3,558	3,709	3,707
Jugo-Slavia	....	....	....	....	....	....	....	3,018
Portugal	....	....	590	....	....	....	....	....
Roumania[3]	5,143	5,104	5,207	5,056	....	[9] 5,728	[10] 6,751	[11] 7,330
Russia proper[3]	3,173	3,186	2,717	2,865	....	....	....	....
Northern Caucasia[3]	750	834	917	....	....	....	....	....
Serbia[3]	1,445	....	....	....	....	....	....	....
Spain	1,134	1,137	1,152	1,154	1,175	1,169	1,179	1,167
Switzerland	....	3	3	4	5	7	6	6
Total	26,688	....	....	....	....	....	....	....
ASIA.								
British India	6,340	6,146	6,144	6,679	6,518	6,442	5,994	....
Japan	130	141	143	144	138	141	137	139
Philippine Islands	992	1,041	1,095	1,069	1,058	1,034	1,064	....
Total	7,462	7,328	7,382	7,892	7,711	7,617	7,195	....
AFRICA.								
Algeria	34	32	....	....	20	....	15	22
Tunis	43	44	57	40	46	36	45	30
Egypt	1,857	1,889	1,846	1,740	1,685	1,812	1,896	....
Morocco	....	....	625	355	354	405	....	....
Union of South Africa	....	....	2,562	2,740	3,150	3,300	3,952	3,122
Total	1,934	....	....	....	5,255	....	....	....
AUSTRALASIA.								
Australia:								
Queensland	143	157	176	146	181	165	150	....
New South Wales	190	157	144	154	155	146	115	....
Victoria	18	18	19	22	23	21	22	....
Western Australia	....	(12)	(12)	(12)	(12)	(12)	(12)	....
South Australia	1	(12)	(12)	1	(12)	(12)	(12)	....
Total	352	332	339	323	359	332	287	....
New Zealand	10	6	5	8	6	8	10	....
Total Australasia	362	338	341	331	365	340	297	....
Grand total	161,279	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were not available.
[2] Unofficial.
[3] Old boundaries.
[4] Excludes Galicia and Bukowina.
[5] Includes Galicia and Bukowina; excludes Goritz and Gradisca.
[6] Includes Galicia; excludes Bukowina, Goritz, and Gradisca.
[7] New boundaries.
[8] Moravia only.
[9] Includes Bessarabia, but excludes Dobrudja.
[10] Former Kingdom, Bessarabia, and Bukowina.
[11] Former Kingdom, Bessarabia, Bukowina, and Transylvania.
[12] Less than 500 acres.

CORN—Continued.

TABLE 1.—*Corn: Area and production in undermentioned countries, 1909–1920*—Contd.

PRODUCTION.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	2,708,334	2,672,804	2,994,793	2,566,927	3,065,233	2,502,665	2,858,509	3,232,367
Canada:								
Ontario	17,436	13,410	13,860	5,960	5,960	13,015	15,152	12,915
Quebec	736	514	508	322	1,803	1,190	1,788	1,420
Other	6	....	....	....	....	....	....	....
Total	18,178	13,924	14,368	6,282	7,763	14,205	16,940	14,335
Mexico	164,657	78,443	60,000	132,823	....	75,985	....	....
Total	2,891,169	2,765,171	3,069,161	2,706,032	....	2,592,855	....	....
SOUTH AMERICA.								
Argentina	174,502	263,135	338,235	161,133	58,839	170,660	240,144	258,686
Chile	1,390	1,505	1,842	1,570	1,338	1,446	1,702	1,689
Uruguay	6,027	7,142	11,382	4,604	6,815	7,086	6,574	2,784
Total	181,919	271,782	351,459	167,307	66,992	179,192	248,420	263,159
EUROPE.								
Austria	[2] 14,536	[3] 10,771	[3] 8,050	....	2,810	2,291	2,115	....
Hungary proper[2]	168,081	172,308	180,550	....	....	....	....	[4] 48,319
Croatia Slavonia[2]	24,873	25,000	25,000	....	....	....	....	....
Bosnia Herzegovina[2]	9,111	7,000	7,000	....	....	....	....	....
Bulgaria[2]	28,219	30,901	29,821	17,471	17,780	8,144	[4] 39,412	[4] 39,650
Czecho-Slovakia	....	....	....	....	....	....	[5] 448	6,299
France[2]	22,229	22,530	17,104	16,635	14,902	9,760	[6] 9,976	[6] 16,793
Italy	100,349	104,966	121,824	81,547	82,771	76,590	85,846	86,661
Jugo-Slavia	....	....	....	....	....	....	....	86,555
Portugal	15,000	15,000	9,275	....	....	....	....	....
Roumania[2]	100,620	102,552	86,412	....	....	....	[7] 137,412	[8] 92,950
Russia proper[2]	56,571	61,670	44,663	62,207	....	....	....	....
Northern Caucasia[2]	13,651	19,241	18,520	....	....	....	....	....
Serbia[2]	28,128	20,000	12,000	....	....	....	....	....
Spain	26,548	30,325	29,096	28,642	29,369	24,141	25,555	27,692
Switzerland	....	106	138	150	252	358	287	280
Total	607,916	622,370	589,453	....	....	....	....	....
ASIA.								
British India	87,240	83,360	83,280	100,080	93,760	96,600	70,808	....
Japan	3,637	3,753	4,022	4,102	3,791	3,757	....	....
Philippine Islands	7,446	13,336	14,753	14,083	13,441	11,271	13,095	....
Total	98,323	100,449	102,055	118,265	110,992	111,628	....	....
AFRICA.								
Algeria	461	350	350	....	302	....	236	253
Tunis	....	....	....	....	....	....	257	197
Egypt	64,220	73,191	73,956	65,485	65,198	66,756	....	....
Morocco	....	....	....	....	3,113	3,364	....	2,858
Union of South Africa	26,498	....	36,607	26,304	36,516	45,143	41,291	42,966
Total	91,179	....	....	....	....	....	....	....
AUSTRALASIA.								
Australia:								
Queensland	3,280	3,915	4,261	2,003	3,019	4,188	4,106	....
New South Wales	6,091	4,453	3,175	3,773	4,333	3,500	2,091	....
Victoria	887	801	1,018	1,000	1,172	1,153	712	....
Western Australia	1	2	(9)	(9)	1	1	1	....
South Australia	5	2	1	16	1	1	2	....
Total	10,264	9,173	8,455	6,792	8,526	8,843	6,912	....
New Zealand	493	312	284	340	274	368	415	....
Total	10,757	9,485	8,739	7,132	8,800	9,211	7,327	....
Grand total	3,881,263	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] New boundaries.
[5] Moravia only.
[6] Excludes Alsace-Lorraine.
[7] Former Kingdom, Bessarabia, and Bukowina.
[8] Former Kingdom and Bessarabia.
[9] Less than 500 bushels.

CORN—Continued.

TABLE 2.—*Corn: World production so far as reported, 1895–1916.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1895	2,834,750,000	1901	2,366,883,000	1907	3,420,321,000	1913	3,587,429,000
1896	2,964,435,000	1902	3,187,311,000	1908	3,606,931,000	1914	3,777,913,000
1897	2,587,206,000	1903	3,066,506,000	1909	3,563,226,000	1915	4,201,589,000
1898	2,682,619,000	1904	3,109,252,000	1910	4,031,630,000	1916	3,642,103,000
1899	2,724,100,000	1905	3,461,181,000	1911	3,481,007,000		
1900	2,792,561,000	1906	3,963,645,000	1912	4,371,888,000		

TABLE 3.—*Corn: Average yield per acre in undermentioned countries, 1890–1920.*

Year.	United States.	Russia (European).[1]	Italy.	Austria.	Hungary (proper).	France.	Argentina.
Average:	*Bushels.*[2]	*Bushels.*[2]	*Bushels.*[2]	*Bushels.*[2]	*Bushels.*[2]	*Bushels.*[2]	*Bushels.*[2]
1890–1899	24.5	13.6	15.3	19.5	23.0	19.1	....
1900–1909	25.8	13.9	21.4	18.9	22.2	18.9	26.6
1910–1914	26.1	....	24.9	19.9	28.0	18.9	23.5
1906	30.3	23.1	20.2	21.5	27.3	12.9	29.0
1907	25.9	14.5	19.9	19.3	24.7	19.7	10.2
1908	26.2	16.7	21.8	18.0	24.3	21.4	31.9
1909	25.5	9.6	25.0	19.4	26.0	21.3	24.1
1910	27.7	22.1	25.3	22.6	30.5	19.6	23.6
1911	23.9	21.4	23.1	15.9	22.7	16.1	3.5
1912	29.2	18.5	25.0	20.4	28.4	20.2	35.0
1913	23.1	17.7	27.9	18.8	29.3	18.9	20.8
1914	25.8	12.6	26.9	22.9	28.0	19.7	25.6
1915	28.2	10.9	31.4	22.8	29.2	18.3	32.6
1916	24.4	13.6	20.9	15.8	....	18.9	10.2
1917	26.3	....	21.8	....	....	17.6	4.1
1918	24.0	....	21.5	....	....	12.9	12.3
1919	28.6	....	....	....	....	15.9	....
1920	31.0	....	....	....	....	....	....

[1] Excludes Poland.

[2] Bushels of 56 pounds.

CORN—Continued.

TABLE 4.—*Corn: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year	Acreage (000 omitted)	Average yield per acre.	Production (000 omitted).	Average farm price per bushel Dec. 1.	Farm value Dec. 1 (000 omitted).	Chicago cash price per bushel, contract.[1] December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, including corn meal, fiscal year beginning July 1.	Imports during fiscal year beginning July 1.	Per cent of crop exported.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*	*Bushels.*	*P. ct.*
1849	....	......	*592,071*	......	....	.....	.....	.....	.....	7,632,860	....	1.3
1859	....	......	*838,793*	......	....	.....	.....	.....	.....	4,248,991	49,190	.5
1866	34,307	25.3	867,946	47.4	411,451	53	62	64	79	16,026,947	34,970	1.8
1867	32,520	23.6	768,320	57.0	437,770	61	65	61	71	12,493,522	49,922	1.6
1868	34,887	26.0	906,527	46.8	424,057	38	58	44	51	8,286,665	89,809	.9
1869	37,103	23.6	874,320	59.8	522,551	56	67	73	85	2,140,487	88,980	.2
1869	....	......	*760,945*	......	....	.....	.....	.....	.....	....	....	.....
1870	38,647	28.3	1,094,255	49.4	540,520	41	59	46	52	10,673,553	111,080	1.0
1871	34,091	29.1	991,898	43.4	430,356	36	39	38	43	35,727,010	58,568	3.6
1872	35,527	30.8	1,092,719	35.3	385,736	27	28	34	39	40,154,374	61,536	3.7
1873	39,197	23.8	932,274	44.2	411,961	40	49	49	59	35,985,834	76,003	3.9
1874	41,037	20.7	850,148	58.4	496,271	64	76	53	67	30,025,036	38,098	3.5
1875	44,841	29.5	1,321,069	36.7	484,675	40	47	41	45	50,910,532	51,796	3.9
1876	49,033	26.2	1,283,828	34.0	436,109	40	43	43	56	72,652,611	30,902	5.7
1877	50,369	26.7	1,342,558	34.8	467,635	41	49	35	41	87,192,110	13,423	6.5
1878	51,585	26.9	1,388,219	31.7	440,281	30	32	33	36	87,884,892	33,869	6.3
1879	53,085	29.2	1,547,902	37.5	580,486	39	43¼	32⅝	36⅛	99,572,329	58,876	6.4
1879	*62,369*	*28.1*	*1,754,592*	......	....	.....	.....	.....	.....	....	....	.....
1880	62,318	27.6	1,717,435	39.6	679,714	35⅝	42	41½	45	93,648,147	75,155	5.5
1881	64,262	18.6	1,194,916	63.6	759,482	58⅜	63½	69	76⅞	44,340,683	69,621	3.7
1882	65,660	24.6	1,617,025	48.5	783,867	49¼	61	53¼	56¾	41,655,653	25,989	2.6
1883	68,302	22.7	1,551,067	42.4	658,051	54¼	63⅛	52½	57	46,258,606	4,894	3.0
1884	69,684	25.8	1,795,528	35.7	640,736	34½	40¼	44¾	49	52,876,456	4,507	2.9
1885	73,130	26.5	1,936,176	32.8	635,675	36	42¾	34¼	36¾	64,829,617	16,104	3.3
1886	75,694	22.0	1,665,441	36.6	610,311	35¾	38	36⅞	39⅜	41,368,584	30,536	2.5
1887	72,393	20.1	1,456,161	44.4	646,107	47	51⅛	54	60	25,360,869	37,493	1.7
1888	75,673	26.3	1,987,790	34.1	677,562	33⅛	35⅞	33⅛	35⅜	70,841,673	2,401	3.6
1889	78,320	27.0	2,112,892	28.3	597,919	29¼	35	32¾	35	103,418,709	1,626	4.9
1889	*72,088*	*29.4*	*2,122,328*	......	....	.....	.....	.....	.....	....	....	.....
1890	71,971	20.7	1,489,970	50.6	754,433	47¾	53	55	69½	32,041,529	2,111	2.2
1891	76,205	27.0	2,060,154	40.6	836,439	39⅜	59	40¾	[2]100	76,602,285	15,290	3.7
1892	70,627	23.1	1,628,464	39.4	642,147	40	42⅞	39½	44½	47,121,894	1,881	2.9
1893	72,036	22.5	1,619,496	36.5	591,626	34¼	36½	36¾	38½	66,489,529	2,199	4.1
1894	62,582	19.4	1,212,770	45.7	554,719	44¾	47½	47¾	55½	28,585,405	16,575	2.4
1895	82,076	26.2	2,151,139	25.3	544,986	25	26¾	27½	29½	101,100,375	4,338	4.7
1896	81,027	28.2	2,283,875	21.5	491,007	22½	23¾	23	25½	178,817,417	6,284	7.8
1897	80,095	23.8	1,902,968	26.3	501,073	25	27½	32⅜	37	212,055,543	3,417	11.1
1898	77,722	24.8	1,924,185	28.7	552,023	33⅛	38	32½	34⅜	177,255,046	4,171	9.2
1899	82,109	25.3	2,078,144	30.3	629,210	30	31½	36	40½	213,123,412	2,480	10.3
1899	*94,914*	*28.1*	*2,666,324*	......	....	.....	.....	.....	.....	....	....	.....
1900	83,321	25.3	2,105,103	35.7	751,220	35¼	40½	42⅝	58½	181,405,473	5,169	8.6
1901	91,350	16.7	1,522,520	60.5	921,556	62¼	67½	59⅛	64¾	28,028,688	18,278	1.8
1902	94,044	26.8	2,523,648	40.3	1,017,017	43¾	57¼	44	46	76,639,261	40,919	3.0
1903	88,092	25.5	2,244,177	42.5	952,869	41	43¾	47¼	50	58,222,061	16,633	2.6
1904	92,232	26.8	2,467,481	44.1	1,087,461	43½	49	48	64½	90,293,483	15,443	3.7
1905	94,011	28.8	2,707,994	41.2	1,116,697	42	50¼	47½	50	119,893,833	10,127	4.4
1906	96,738	30.3	2,927,416	39.9	1,166,626	40	46	49¼	56	86,368,228	10,818	3.0
1907	99,931	25.9	2,592,320	51.6	1,336,901	57½	61½	67¾	82	55,063,860	20,312	2.1
1908	101,788	26.2	2,668,651	60.6	1,616,145	56¾	62¼	72¼	76	37,665,040	258,065	1.4
1909	108,771	25.5	2,772,376	......	....	.....	.....	.....	.....	....	....	.....
1909	*98,383*	*25.9*	*2,552,190*	57.9	1,477,222	62½	66	56	63	38,128,498	....	1.5

[1] No. 2 to 1908.

[2] Coincident with "corner."

CORN—Continued.

TABLE 4.—*Corn: Acreage, production, value, exports, etc., in the United States, 1849–1920*—Continued.

Year.	Acreage (000 omitted)	Average yield per acre.	Production (000 omitted).	Average farm price per bushel Dec. 1.	Farm value Dec. 1 (000 omitted).	Chicago cash price per bushel, contract. December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, including corn meal, fiscal year beginning July 1.	Imports during fiscal year beginning July 1.	Per cent of crop exported.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*	*Bushels.*	*P. ct.*
1910[1]	104,035	27.7	2,886,260	48.0	1,384,817	45½	50	52¼	55¼	65,614,522	....	2.3
1911	105,825	23.9	2,531,488	61.8	1,565,258	68	70	76¼	82½	41,797,291	53,425	1.7
1912	107,083	29.2	3,124,746	48.7	1,520,454	47½	54	55¼	60	50,780,143	903,062	1.6
1913	105,820	23.1	2,446,988	69.1	1,692,092	64	73½	67	72½	10,725,819	12,367,369	.4
1914	103,435	25.8	2,672,804	64.4	1,722,070	62¼	68¼	50½	56	50,668,303	9,897,939	1.9
1915	106,197	28.2	2,994,793	57.5	1,722,680	69½	75	69	78½	39,896,928	5,208,497	1.3
1916	105,296	24.4	2,566,927	88.9	2,280,729	88	96	152	174	66,753,294	2,267,299	2.6
1917	116,730	26.3	3,065,233	127.9	3,920,228	160	190	150	170	49,073,263	3,196,420	1.6
1918	104,467	24.0	2,502,665	136.5	3,416,240	135	155	160½	185	23,018,822	3,311,211	.9
1919	100,072	28.6	2,858,509	134.7	3,851,741	142	160	189	217	16,707,447	10,229,249	.6
1920	104,601	30.9	3,232,367	67.7	2,189,721	70¼	86	.....	.....	....	....	....

[1] Figures adjusted to census basis.

TABLE 5.—*Corn: Revised acreage, production, and farm value, 1879, and 1889–1909.*

NOTE.—This revision for 1879 and 1889–1909 consists (1) in using the Department of Agriculture's estimates of average yield per acre to compute, from census acreage, the total production, (2) in adjusting the Department's estimates of acreage for each year so as to be consistent with the following as well as the preceding census acreage, and (3) in recomputing total farm value from these revised production figures.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1879	*62,369,000*	29.2	1,823,163,000	37.1	676,251,000
1889	*72,088,000*	27.7	1,998,648,000	27.4	546,984,000
1890	70,390,000	20.7	1,460,406,000	50.0	729,647,000
1891	74,496,000	27.6	2,055,823,000	39.7	816,917,000
1892	72,610,000	23.6	1,713,688,000	38.8	664,390,000
1893	74,434,000	22.9	1,707,572,000	35.9	612,998,000
1894	69,396,000	19.3	1,339,680,000	45.1	604,523,000
1895	85,567,000	27.0	2,310,952,000	25.0	578,408,000
1896	86,560,000	28.9	2,503,481,000	21.3	532,881,000
1897	88,127,000	24.3	2,144,553,000	26.0	558,309,000
1898	88,304,000	25.6	2,261,119,000	28.4	642,747,000
1899	*94,914,000*	25.9	2,454,626,000	29.9	734,917,000
1900	95,042,000	26.4	2,505,148,000	35.1	878,243,000
1901	94,636,000	17.0	1,607,288,000	60.0	964,513,000
1902	95,517,000	27.4	2,620,699,000	40.0	1,048,735,000
1903	90,661,000	25.8	2,339,417,000	42.1	984,173,000
1904	93,340,000	27.0	2,520,682,000	43.7	1,101,430,000
1905	93,573,000	29.3	2,741,329,000	40.7	1,116,817,000
1906	93,643,000	30.9	2,895,822,000	39.2	1,135,969,000
1907	94,971,000	26.5	2,512,065,000	50.9	1,277,607,000
1908	95,603,000	26.6	2,544,957,000	60.0	1,527,679,000
1909	*98,383,000*	26.1	2,572,336,000	58.6	1,507,185,000

CORN—Continued.

TABLE 6.—*Corn: Acreage, production, and total farm value, by States, 1919 and 1920*

State.	Thousands of acres.		Production (thousands of bushels).		Total value, basis Dec. 1 price (thousands of dollars).	
	1920	1919	1920	1919	1920	1919
	Acres.	*Acres.*	*Bush.*	*Bush.*	*Dolls.*	*Dolls.*
Maine	5	5	226	300	289	585
New Hampshire	9	11	405	512	587	870
Vermont	25	22	1, 175	1, 034	1, 480	1, 810
Massachusetts	21	26	840	1, 508	1, 050	2, 594
Rhode Island	8	8	320	360	576	670
Connecticut	44	50	1, 804	2, 900	2, 526	5, 220
New York	795	820	32, 595	35, 260	37, 810	58, 532
New Jersey	260	260	11, 440	10, 400	9, 724	15, 912
Pennsylvania	1, 490	1, 536	67, 050	72, 192	67, 050	106, 122
Delaware	190	195	7, 125	5, 850	5, 344	8, 482
Maryland	670	680	25, 795	27, 880	20, 894	39, 032
Virginia	1, 670	1, 670	50, 100	46, 760	50, 100	79, 024
West Virginia	650	650	22, 100	22, 100	25, 636	36, 244
North Carolina	2, 784	2, 800	64, 032	53, 200	72, 356	98, 420
South Carolina	2, 230	2, 270	42, 370	36, 320	49, 149	71, 550
Georgia	5, 100	4, 820	76, 500	69, 890	80, 325	111, 824
Florida	780	830	10, 530	12, 450	10, 530	17, 430
Ohio	3, 735	3, 668	162, 099	161, 392	110, 227	195, 284
Indiana	4, 545	4, 500	184, 072	166, 500	108, 602	208, 125
Illinois	8, 652	8, 400	294, 168	294, 000	173, 559	382, 200
Michigan	1, 625	1, 625	65, 000	65, 000	53, 300	89, 700
Wisconsin	1, 960	1, 845	86, 044	86, 715	66, 254	108, 394
Minnesota	3, 150	2, 900	118, 125	116, 000	60, 244	139, 200
Iowa	10, 300	10, 000	473, 800	416, 000	222, 686	499, 200
Missouri	6, 215	5, 650	198, 880	152, 550	127, 283	210, 519
North Dakota	711	508	17, 064	16, 764	12, 286	23, 470
South Dakota	3, 520	3, 200	105, 600	91, 200	44, 352	108, 528
Nebraska	7, 560	7, 030	255, 528	184, 186	104, 766	224, 707
Kansas	5, 190	4, 100	137, 535	62, 320	60, 515	87, 248
Kentucky	3, 300	3, 300	100, 650	82, 500	82, 533	127, 875
Tennessee	3, 325	3, 300	93, 100	70, 620	80, 997	110, 873
Alabama	4, 277	4, 334	67, 149	62, 843	65, 806	99, 920
Mississippi	3, 980	3, 980	63, 680	59, 700	64, 954	95, 520
Louisiana	1, 906	1, 850	36, 595	32, 375	31, 106	48, 562
Texas	6, 700	6, 500	174, 200	195, 000	146, 328	230, 100
Oklahoma	3, 190	2, 900	89, 320	69, 600	48, 233	88, 392
Arkansas	2, 360	2, 407	55, 224	43, 326	53, 567	71, 055
Montana	179	128	3, 580	1, 728	2, 864	2, 851
Wyoming	65	50	1, 560	800	874	1, 320
Colorado	843	704	17, 450	11, 757	12, 215	16, 695
New Mexico	270	243	7, 155	7, 290	7, 870	11, 008
Arizona	28	30	644	900	1, 095	1, 800
Utah	24	18	521	324	782	486
Nevada	1	1	33	30	53	42
Idaho	45	35	1, 800	1, 225	1, 800	2, 021
Washington	78	78	2, 808	2, 808	3, 510	5, 195
Oregon	46	45	1, 426	1, 170	1, 854	1, 814
California	90	90	3, 150	2, 970	3, 780	5, 316
United States	104, 601	100, 072	3, 232, 367	2, 858, 509	2, 189, 721	3, 851, 741

CORN—Continued.

TABLE 7.—*Corn: Production and distribution in the United States, 1897–1920.*

[000 omitted, except in percentage columns.]

Year.	Old stock on farms Nov. 1.	Crop.			Total supplies.	Stock on farms Mar. 1 following.	Shipped out of county where grown.
		Quantity.	Quality.	Proportion merchantable.			
	Bushels.	*Bushels.*	*Per cent.*	*Per cent.*	*Bushels.*	*Bushels.*	*Bushels.*
1897	290, 934	1, 902, 968	86. 3	86. 8	2, 193, 902	782, 871	411, 617
1898	137, 894	1, 924, 185	83. 8	82. 2	2, 062, 079	800, 533	396, 005
1899	113, 644	2, 078, 144	87. 2	86. 9	2, 191, 788	733, 730	348, 098
1900	92, 328	2, 105, 103	85. 5	86. 3	2, 197, 431	776, 166	478, 417
1901	95, 825	1, 522, 520	73. 7	....	1, 618, 345	441, 132	153, 213
1902	29, 267	2, 523, 648	83. 1	76. 2	2, 552, 915	1, 050, 653	557, 296
1903	131, 210	2, 244, 177	86. 2	76. 0	2, 375, 387	839, 053	419, 877
1904	80, 246	2, 467, 481	90. 6	84. 8	2, 547, 727	954, 268	551, 635
1905	82, 285	2, 707, 994	90. 6	88. 4	2, 790, 279	1, 108, 364	681, 539
1906	119, 633	2, 927, 416	89. 9	89. 1	3, 047, 049	1, 297, 979	679, 544
1907	130, 995	2, 592, 320	82. 8	77. 7	2, 723, 315	962, 429	467, 675
1908	71, 124	2, 668, 651	86. 9	88. 2	2, 739, 775	1, 047, 763	568, 129
1909	79, 779	2, 552, 190	84. 2	82. 5	2, 631, 969	977, 561	635, 248
1910	115, 696	2, 886, 260	87. 2	86. 4	3, 001, 956	1, 165, 378	661, 777
1911	123, 824	2, 531, 488	80. 6	80. 1	2, 655, 312	884, 059	517, 766
1912	64, 764	3, 124, 746	85. 5	85. 0	3, 189, 510	1, 290, 642	680, 831
1913	137, 972	2, 446, 988	82. 2	80. 1	2, 584, 960	866, 352	422, 059
1914	80, 046	2, 672, 804	85. 1	84. 5	2, 752, 850	910, 894	498, 285
1915	96, 009	2, 994, 793	77. 2	71. 1	3, 090, 802	1, 116, 559	560, 824
1916	87, 908	2, 566, 927	83. 8	83. 9	2, 654, 835	782, 303	450, 589
1917	34, 448	3, 065, 233	75. 2	60. 0	3, 099, 681	1, 253, 290	678, 027
1918	114, 678	2, 502, 665	85. 6	82. 4	2, 617, 343	855, 269	362, 589
1919	69, 835	2, 858, 509	89. 1	87. 0	2, 928, 344	1, 070, 677	406, 615
1920	139, 906	3, 232, 367	89. 6	....	3, 372, 273	....	....

TABLE 8.—*Corn (merchantable): Total corn crop and portion of merchantable quality, 1883–1920.*

Year of crop growth.	Crop, bushels.	Per cent merchantable.	Bushels merchantable.	Year of crop growth.	Crop, bushels.	Per cent merchantable.	Bushels merchantable.
1920	3, 232, 367, 000	....	....	1901	1, 522, 520, 000	....	....
1919	2, 858, 509, 000	87. 0	2, 486, 296, 000	1900	2, 105, 103, 000	86. 3	1, 815, 938, 000
1918	2, 502, 665, 000	82. 4	2, 062, 041, 000	1899	2, 078, 144, 000	86. 9	1, 806, 663, 000
1917	3, 065, 233, 000	60. 0	1, 837, 728, 000	1898	1, 924, 185, 000	82. 2	1, 582, 541, 000
1916	2, 566, 927, 000	83. 9	2, 154, 487, 000	1897	1, 902, 968, 000	86. 8	1, 650, 847, 000
1915	2, 994, 793, 000	71. 1	2, 127, 965, 000	1896	2, 283, 875, 000	84. 8	1, 936, 207, 000
1914	2, 672, 804, 000	81. 5	2, 259, 755, 000	1895	2, 151, 139, 000	88. 1	1, 895, 706, 000
1913	2, 446, 988, 000	80. 1	1, 961, 058, 000	1894	1, 212, 770, 000	82. 4	999, 402, 000
1912	3, 124, 746, 000	85. 0	2, 654, 907, 000	1893	1, 619, 494, 000	85. 6	1, 386, 357, 000
1911	2, 531, 488, 000	80. 1	2, 027, 922, 000	1892	1, 628, 464, 000	82. 6	1, 345, 445, 000
1910	2, 886, 260, 000	86. 4	2, 492, 763, 000	1891	2, 060, 154, 000	88. 5	1, 822, 431, 000
1909	2, 552, 190, 000	82. 5	2, 104, 775, 000	1890	1, 489, 970, 000	79. 5	1, 183, 795, 000
1908	2, 668, 651, 000	88. 2	2, 353, 370, 000	1889	2, 111, 892, 000	85. 7	1, 810, 558, 000
1907	2, 592, 320, 000	77. 7	2, 013, 208, 000	1888	1, 987, 790, 000	82. 4	1, 637, 406, 000
1906	2, 927, 416, 000	89. 1	2, 609, 060, 000	1887	1, 456, 161, 000	83. 9	1, 222, 166, 000
1905	2, 707, 994, 000	88. 4	2, 394, 462, 000	1886	1, 665, 441, 000	86. 4	1, 438, 447, 000
1904	2, 467, 481, 000	84. 8	2, 091, 195, 000	1885	1, 936, 176, 000	81. 8	1, 583, 013, 000
1903	2, 244, 177, 000	76. 0	1, 706, 006, 000	1884	1, 795, 528, 000	88. 7	1, 593, 332, 000
1902	2, 523, 648, 000	76. 2	1, 923, 292, 000	1883	1, 551, 067, 000	60. 3	935, 901, 000

CORN—Continued.

TABLE 9.—*Corn: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911-1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911-1920.	1916	1917	1918	1919	1920	5-year average, 1915-1919.	1920
Me.	44.9	44.0	40.0	38.0	46.0	41.0	43.0	37.0	45.0	60.0	45.1	126	119	228	167	195	128	72.50	57.73
N. H.	44.2	45.0	46.0	37.0	46.0	45.0	46.0	40.0	45.0	46.5	45.0	119	115	217	150	170	145	64.09	65.25
Vt.	43.1	41.0	40.0	37.0	47.0	46.0	43.0	45.0	38.0	47.0	47.0	119	110	213	170	175	126	65.73	59.22
Mass.	46.0	44.0	45.0	40.5	47.0	47.0	42.0	45.0	52.0	58.0	40.0	121	120	215	170	172	125	74.58	50.00
R. I.	41.0	45.0	41.5	39.5	42.0	43.0	31.0	42.0	44.0	45.0	40.0	140	138	236	180	186	180	69.56	72.00
Conn.	47.5	48.5	50.0	38.5	46.0	50.0	43.0	50.0	50.0	58.0	41.0	124	120	215	171	180	140	78.30	57.40
N. Y.	36.8	38.5	38.6	28.5	41.0	40.0	30.0	31.0	36.0	43.0	41.0	115	110	198	175	166	116	51.99	47.56
N. J.	39.8	36.8	38.0	39.5	38.5	38.0	40.0	42.0	41.0	40.0	44.0	102	100	170	150	153	85	52.52	37.40
Pa.	41.7	44.5	42.5	39.0	42.5	38.5	39.0	39.0	40.0	47.0	45.0	100	97	153	155	147	100	51.11	45.00
Del.	33.4	34.0	34.0	31.5	36.0	31.5	34.0	34.0	31.0	30.0	37.5	88	89	140	136	145	75	36.61	28.12
Md.	37.0	36.5	36.5	33.0	37.0	35.0	39.0	39.0	35.0	41.0	38.5	90	89	140	135	140	81	43.06	31.18
Va.	26.4	24.0	24.0	26.0	20.5	28.5	28.0	27.0	28.0	28.0	30.0	105	93	153	160	169	100	35.94	30.00
W. Va.	31.2	25.7	33.8	31.0	31.0	31.5	30.5	30.0	31.0	34.0	34.[illegible]	111	101	170	180	164	116	43.33	39.44
N. C.	19.9	18.4	18.2	19.5	20.3	21.0	18.5	20.0	21.0	19.0	23.0	117	110	170	177	185	113	28.57	25.99
S. C.	17.7	18.2	17.9	19.5	18.5	16.5	15.5	19.0	17.0	16.0	19.0	126	113	192	195	197	116	26.61	22.04
Ga.	15.0	16.0	13.8	15.5	14.0	15.0	15.5	16.0	15.0	14.5	15.0	111	100	160	165	160	105	20.15	15.75
Fla.	14.8	14.6	13.0	15.0	16.0	15.0	15.0	15.0	16.0	15.0	13.5	100	90	140	138	140	100	17.71	13.50
Ohio.	39.2	38.6	42.8	37.5	39.1	41.5	31.5	38.0	36.0	44.0	43.4	83	90	136	130	121	68	40.66	29.51
Ind.	36.4	36.0	40.3	36.0	33.0	38.0	34.0	36.0	33.0	37.0	40.5	78	84	125	119	125	59	35.69	23.90
Ill.	33.7	33.0	40.0	27.0	29.0	36.0	29.5	38.0	35.5	35.0	34.0	78	84	110	120	130	59	34.82	20.06
Mich.	32.8	33.0	34.0	33.5	36.0	32.0	27.5	21.5	30.0	40.0	40.0	95	95	182	130	138	82	36.24	32.80
Wis.	36.5	36.3	35.7	40.5	40.5	23.0	36.0	22.0	40.2	47.0	43.9	89	92	163	130	125	77	39.13	33.80
Minn.	34.7	33.7	34.5	40.0	35.0	23.0	33.5	30.0	40.0	40.0	37.5	73	80	110	111	120	51	33.29	19.12
Iowa.	37.3	31.0	43.0	34.0	38.0	30.0	36.5	37.0	36.0	41.6	46.0	73	80	108	122	120	47	35.66	21.62
Mo.	26.0	26.0	32.0	17.5	22.0	29.5	19.5	35.0	20.0	27.0	32.0	85	90	114	143	138	64	28.03	20.48
N. Dak.	23.4	25.0	26.7	28.8	28.0	14.0	26.5	9.0	19.0	33.0	24.0	86	84	151	130	140	72	23.23	17.28
S. Dak.	28.2	22.0	30.6	25.5	26.0	29.0	28.5	28.0	34.0	28.5	30.0	71	77	120	110	119	42	28.21	12.60
Nebr.	24.5	21.0	24.0	15.0	24.5	30.0	26.0	27.0	17.7	26.2	33.8	75	78	120	128	122	41	24.28	13.86
Kans.	16.2	14.5	23.0	3.2	18.5	31.0	10.0	13.0	7.1	15.2	26.5	84	90	125	149	140	44	14.58	11.66
Ky.	27.3	26.0	30.4	20.5	25.0	30.0	28.0	31.5	26.0	25.0	30.5	90	87	121	146	155	82	31.20	25.01
Tenn.	25.3	26.8	26.5	20.5	24.0	27.0	26.0	29.0	24.0	21.4	28.0	93	94	120	145	157	87	28.66	24.36
Ala.	16.0	18.0	17.2	17.3	17.0	17.0	12.5	16.0	14.6	14.5	15.7	103	102	125	148	159	98	17.83	15.39
Miss.	17.7	19.0	18.3	20.0	18.5	19.0	14.0	20.5	17.0	15.0	16.0	101	98	138	151	160	102	20.81	16.32
La.	19.0	18.5	18.0	22.0	19.3	20.5	21.0	18.0	16.0	17.5	19.2	99	94	146	161	150	85	22.23	16.32
Tex.	19.4	9.5	21.0	24.0	19.5	23.5	19.0	11.0	10.0	30.0	26.0	101	104	167	176	118	84	20.95	21.84
Okla.	13.0	6.5	18.7	11.0	12.5	29.5	13.5	8.5	7.5	24.0	28.0	88	93	147	164	127	54	16.28	15.12
Ark.	19.7	20.8	20.4	19.0	17.5	23.0	17.7	24.0	13.0	18.0	23.4	104	98	140	180	164	97	23.72	22.70
Mont.	23.2	26.5	25.5	31.5	28.0	28.0	25.0	12.5	21.0	13.5	20.0	102	93	175	135	165	80	23.02	16.00
Wyo.	22.4	15.0	23.0	29.0	25.0	25.0	22.0	20.0	25.0	16.0	24.0	98	90	175	140	165	56	26.59	13.44
Colo.	18.7	14.0	20.8	15.0	23.0	24.0	15.5	20.0	17.5	16.7	20.7	88	90	125	135	142	70	19.90	14.49
N. Mex.	24.2	24.7	22.4	18.5	28.0	26.0	21.0	20.0	25.0	30.0	26.5	113	113	188	180	151	110	34.12	29.15
Ariz.	29.9	33.0	33.0	28.0	32.0	30.0	35.0	27.0	28.0	30.0	23.0	145	140	190	210	200	170	50.72	39.10
Utah.	29.4	35.0	30.0	34.0	35.0	34.0	33.0	25.0	28.0	18.0	21.7	115	115	170	181	150	150	37.07	32.55
Nev.	32.5	30.5	30.0	34.0	36.0	35.0	34.0	30.0	32.0	30.0	33.4	129	125	150	210	140	160	45.85	53.44
Idaho.	34.2	30.0	32.8	32.0	31.0	35.0	35.0	31.0	40.0	35.0	40.0	106	100	155	183	165	100	47.35	40.00
Wash.	32.2	28.5	27.3	28.0	27.0	27.0	37.0	37.0	38.0	36.0	36.0	113	100	162	170	185	125	49.79	45.00
Oreg.	30.5	28.5	31.5	25.5	30.0	35.0	33.5	30.0	31.0	26.0	31.0	107	95	150	155	155	130	38.77	40.30
Calif.	35.0	36.0	37.0	33.0	36.0	41.0	32.0	32.0	35.0	33.0	35.0	124	124	185	193	179	120	52.32	42.00
U. S.	26.4	23.9	29.2	23.1	25.8	28.2	24.4	26.3	24.0	28.6	30.9	85.7	88.9	127.9	136.5	134.7	67.7	28.53	20.93

[1] Based upon farm price Dec. 1.

CORN—Continued.

TABLE 10.—*Corn: Condition of crop, United States, on first of months named, 1900–1920.*

Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1900....	89.5	87.5	80.6	78.2	1907....	80.2	82.8	80.2	78.0	1914....	85.8	74.8	71.7	72.9
1901....	81.3	54.0	51.7	52.1	1908....	82.8	82.5	79.4	77.8	1915....	81.2	79.5	78.8	79.7
1902....	87.5	86.5	84.3	79.6	1909....	89.3	84.4	74.6	73.8	1916....	82.0	75.3	71.3	71.5
1903....	79.4	78.7	80.1	80.8	1910....	85.4	79.3	78.2	80.3	1917....	81.1	78.8	76.7	75.9
1904....	86.4	87.3	84.6	83.9	1911....	80.1	69.6	70.3	70.4	1918....	87.1	78.5	67.4	68.6
1905....	87.3	89.0	89.5	89.2	1912....	81.5	80.0	82.1	82.2	1919....	86.7	81.7	80.0	81.3
1906....	87.5	88.0	90.2	90.1	1913....	86.9	75.8	65.1	65.3	1920....	84.6	86.7	86.4	89.1

TABLE 11.—*Corn: Farm price, cents per bushel, on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1..................	140.4	144.7	134.8	90.0	62.1	66.2	69.6	48.9	62.2	48.2	86.7
Feb. 1..................	146.8	138.1	138.8	95.8	66.7	72.8	68.3	50.6	64.6	49.0	89.2
Mar. 1..................	148.5	137.2	154.3	100.9	68.2	75.1	69.1	52.2	66.6	48.9	92.1
Apr. 1..................	158.6	149.6	153.6	113.4	70.3	75.1	70.7	53.7	71.1	49.7	96.6
May 1..................	169.6	162.6	155.7	150.6	72.3	77.7	72.1	56.8	79.4	51.8	104.9
June 1..................	185.2	171.2	152.5	160.1	74.1	77.9	75.0	60.6	82.5	55.1	109.4
July 1..................	185.6	176.5	153.7	164.6	75.4	77.7	75.5	63.2	81.1	60.0	111.3
Aug. 1..................	163.7	191.2	159.7	196.6	79.4	78.9	76.8	65.4	79.3	65.8	115.7
Sept. 1..................	155.7	185.4	165.7	175.5	83.6	77.3	81.5	75.4	77.6	65.9	111.4
Oct. 1..................	121.3	153.9	159.5	175.1	82.3	70.5	78.2	75.3	70.2	65.7	105.2
Nov. 1..................	87.3	133.4	140.3	146.0	85.0	61.9	70.6	70.7	58.4	64.7	91.8
Dec. 1..................	67.7	134.7	136.5	127.9	88.9	57.5	64.4	69.1	48.7	61.8	85.7
Average.........	110.5	151.5	147.3	129.2	73.8	71.2	71.4	59.4	67.6	55.3	96.7

TABLE 12.—*Corn: Monthly marketings by farmers, 1914–1920.*

Month.	Estimated amount sold monthly by farmers of United States (millions of bushels).						Per cent of year's sales.					
	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15
July............	18	27	34	30	31	19	4.5	6.7	5.3	6.2	5.6	3.9
August..........	22	28	26	34	33	34	5.6	6.8	4.0	7.1	5.9	7.1
September.....	20	35	22	28	35	23	4.9	8.4	3.4	5.9	6.4	4.7
October........	22	27	24	25	33	23	5.6	6.7	3.8	5.3	6.0	4.7
November.....	37	30	56	67	57	71	9.2	7.3	8.8	14.0	10.4	14.7
December......	60	49	78	60	88	82	15.0	12.1	12.2	12.5	15.9	16.8
January........	72	61	91	73	61	96	12.9	15.0	11.2	15.1	11.7	19.8
February......	38	30	103	43	68	38	9.5	7.2	16.1	9.0	12.1	7.8
March..........	35	31	88	34	39	22	8.7	7.5	13.7	7.0	7.1	4.6
April...........	24	31	15	26	35	27	5.9	8.2	7.1	5.4	6.1	5.6
May...........	30	33	36	31	35	21	7.6	8.0	5.6	6.5	6.3	4.4
June...........	42	25	37	29	32	29	10.6	6.1	5.8	6.0	5.9	5.9
Season...	400	410	640	480	550	485	100.0	100.0	100.0	100.0	100.0	100.0

CORN—Continued.

TABLE 13.—*Corn: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	10.8	7.3	1.4	0.1	0.3	1.0	0.4	21.4	0.4	3.1	0.1	0.2	25.4
1918	22.1	.9	.5	2.0	.4	6.3	3.2	32.8	.3	2.6	.1	1.5	37.7
1917	12.1	2.9	.6	13.5	.6	1.2	.3	31.6	.3	1.4	.1	.2	33.8
1916	18.5	5.8	1.7	1.7	.4	1.7	1.1	31.3	.3	2.0	.1	.6	34.7
1915	3.0	11.9	2.1	6.9	.6	.2	1.1	26.5	.3	2.1	.1	.2	29.9
1914	20.8	1.3	.4	.4	.5	2.1	.4	26.1	.1	3.6	.1	.2	30.6
1913	27.1	1.2	.4	1.0	.3	3.1	.4	33.7	.1	3.7	.2	.4	38.9
1912	8.7	4.6	.9	1.7	.5	1.0	.3	18.1	.3	4.8	.3	2.3	26.3
1911	23.4	1.6	(1)	.4	.2	3.4	.1	29.6	.2	2.3	.2	.4	33.7
1910	13.9	3.0	.8	.9	.4	1.6	.5	21.3	.2	2.3	.4	1.2	26.0
1909	13.0	7.3	1.5	1.0	.5	1.6	.7	25.8	.2	2.3	.4	.3	29.6
Average	16.3	4.0	.9	2.9	.4	2.2	.5	27.7	.2	2.7	.2	.7	32.1

[1] Less than 0.05 per cent.

TABLE 14.—*Corn: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York.			Baltimore.			Cincinnati.			Chicago.			Detroit.			St. Louis.			San Francisco.		
	No. 2 yellow.			Mixed.[1]			No. 2 mixed.			Contract.[2]			No. 3.[3]			No. 2.[4]			White (per 100 pounds).[5]		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Dolls.*	*Dolls.*	*Dolls.*
January-June	55½	66	58.8	52½	65½	57.3	48	65	56.5	46½	63	54.0	48	62	....	45	64	54.0	1.59	1.80	1.701
July-December	79	86	82.9	64½	68	66.0	63½	81	73.2	60	78¼	71.0	60¾	78½	....	61¾	82	72.6	1.51½	1.87	1.743
1914.																					
January-June	60	82½	75.1	66¼	77	70.6	64	75	72.9	60	73½	66.4	62	71	67.1	63	73½	68.6	1.61	1.78	1.708
July-December	71¼	93¾	82.1	67½	89	79.4	63½	88½	78.3	62¼	86	73.4	63½	88	75.0	62⅜	87	73.6	1.67½	1.93	1.820
1915.																					
January-June	77½	90¼	84.6	72	84¾	78.7	70	81	76.5	68½	79	74.3	70	80	75.6	68½	78½	74.3	1.72	1.90	1.82
July-December	72¾	92¾	82.8	67½	87	77.2	62	84	72.8	59¾	82¼	72.0	64	84	74.9	58¾	81	70.4	1.46	1.80	1.685
1916.																					
January-June	79½	92¾	86.2	70	84⅜	79.6	70½	79	75.7	69	79½	75.2	71½	79½	75.8	69½	77	73.9	1.70	1.80	1.732
July-December	88¼	120	101.6	85¼	107	96.1	79	107	90.0	78	111	90.4	79½	117	94.0	75½	111	89.4	1.75	2.45	1.881
1917.																					
January-June	93½	186	144.2	105	182	140.3	95	176	133.5	93¼	176	131.9	102	176½	136.0	94½	175½	131.6	2.05	3.50	2.73
July-December	154	245	211.1	140	230	189.8	160	235	198.0	160	236	196.2	181	240	211.3	161	233	192.3	3.35	4.67	3.76
1918.																					
January-June	150	221½	181.3	141	195	178.9	140	175	152.2	150	185	168.7	150	215	173.9	148	190	167.9	3.20	3.50	3.40
July-December	140	209¾	176.4	150	195	170.1	130	185	155.7	130	180	152.8	135	187	159.5	142	195	159.3	2.75	3.05	2.88
1919.																					
January-June	100	200	173.2	130	192	163.8	126	185	158.9	122	185½	157.2	125	188	160.7	123	185	157.4	2.10	3.35	2.51
July-December	152½	226½	183.8	160	215	188.0	136¾	210	167.9	133	210	165.6	146	210	170.8	139	203	165.9	3.05	3.50	3.33
1920.																					
January	161¾	173¾	168.9	140	166	163.2	148	161	155.0	142	158½	153.0	150	155	153.1	150	156	152.9	3.45	3.77½	3.659
February	159	172	166.2	162	165	163.2	139	158	151.1	133	156	148.0	147	158	153.8	....	....	....	3.70	3.80	3.759
March	169¾	183¾	179.1	161	173	168.5	157	169	163.1	150	169	160.5	156	168	162.7	158	166	163.0	3.65	3.80	3.722
April	185	199½	192.8	169	180	176.2	171	180	176.0	166½	180	172.6	169	180	175.2	171	178	174.8	3.60	3.90	3.712
May	202¼	231¼	215.4	180	204	195.4	185	210	197.0	189	217	200.0	182	215	204.6	185	213	200.0	3.85	4.25	4.044
June	195¾	219¼	208.2	196	202	198.8	179	197	188.0	176	201½	189.5	185	207	199.3	177	200	187.5	4.15	4.25	4.200
January-June	159	231¼	188.4	140	204	177.6	139	210	171.7	133	217	170.6	147	215	174.8	150	213	175.6	3.45	4.25	3.849
July	163½	195¾	176.5	194	198	196.4	154	171	162.6	140	183½	159.3	150	183	165.2	149	168	160.5	4.15	4.65	4.356
August	159	184¾	176.2	160	165	161.4	147	167	158.5	140	169	158.4	150	175	157.8	144	173	159.8	4.50	4.65	4.575
September	135	178¼	156.5	132	160	147.3	113	156	136.8	119½	154	135.0	120	161	141.4	103	151	128.5	3.25	3.30	3.275
October	107	129¾	115.5	112½	130	117.1	85	102	94.8	81½	110	91.4	95	103½	100.5	86	101	92.5	2.75	3.05	2.926
November	94¾	115½	106.1	100	111	106.4	80	96	91.1	67	94½	82.8	91	100	95.8	65⅝	96	84.7	2.90	3.00	3.167
December	94¾	107	99.8	....	....	....	73	83	78.5	70¼	86	77.4	77	83	80.8	71	83	76.1	2.65	3.30	2.808
July-December	94¾	195¾	138.4	100	198	145.7	73	171	120.4	67	183½	117.4	77	175	125.1	65⅝	173	117.4	2.65	4.65	3.518

[1] No. 3 yellow, beginning Mar., 1919. [2] No. 2 mixed, 1919. [3] No. 3 yellow, 1919-20. [4] No. 3 yellow, 1919.
[5] California yellow, Mar. to Oct., 1919, Egyptian, white, Oct., 1919, to Dec., 1920.

CORN—Continued.

TABLE 15.—*Corn (including meal): International trade, calendar years 1909–1919.*[1]

[The item *maicena* or *maizena* is included as "Corn and cornmeal."]

GENERAL NOTE.—Substantially the international trade of the world. It should not be expected that the world export and import totals for any year will agree. Among sources of disagreement are these: (1) Different periods of time covered in the "year" of the various countries; (2) imports received in year subsequent to year of export; (3) want of uniformity in classification of goods among countries; (4) different practices and varying degrees of failure in recording countries of origin and ultimate destination; (5) different practices of recording reexported goods; (6) opposite methods of treating free ports; (7) clerical errors, which, it may be assumed, are not infrequent.

The exports given are domestic exports, and the imports given are imports for consumption as far as it is feasible and consistent so to express the facts. While there are some inevitable omissions, on the other hand there are some duplications because of reshipments that do not appear as such in official reports. For the United Kingdom import figures refer to imports for consumption when available, otherwise total imports, less exports, of "foreign and colonial merchandise." Figures for the United States include Alaska, Porto Rico, and Hawaii.

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Argentina	115,749	139,461	170,490	113,143	35,194	26,171	97,851
Austria-Hungary	268	....	....	....	....	....	....
Belgium	8,130	....	....	....	....	....	612
British South Africa	4,115	4,926	6,930	6,748	11,284	13,507	13,582
Bulgaria	9,307	....	....	....	....	....	....
Netherlands	8,750	4,345	808	(2)	(2)	....	38
Roumania	38,966	41,804	....	....	....	....	26
Russia	30,034	11,275	53	97	....	....	....
United States	45,054	17,018	50,223	55,237	57,011	47,059	16,002
Uruguay	201	3	93	14	5	....	....
Other countries	10,452	10,997	11,588	9,593	7,970	5,349	....
Total	271,026	229,829	240,185	184,832	111,464	92,086	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	13,877	....	....	....	....	....	....
Belgium	25,801	....	....	....	....	....	1,483
British South Africa	257	52	340	132	196	56	86
Canada	10,629	8,347	10,980	8,832	8,101	11,757	6,459
Cuba	2,746	2,890	3,242	3,810	2,634	1,672	....
Denmark	11,440	10,399	27,354	17,767	9,508	105	....
Egypt	471	687	2	....	44	5	22
France	18,708	16,331	17,582	28,379	6,349	6,748	6,921
Germany	32,160	....	....	....	....	....	....
Italy	14,895	3,313	7,842	2,184	7,935	10,856	8,232
Mexico	4,404	....	....	....	....	....	....
Netherlands	29,580	25,674	43,338	27,514	8,528	346	9,635
Norway	1,079	1,672	1,925	1,889	1,305	2,531	....
Portugal	1,674	3,105	471	443	693	....	....
Russia	335	576	53	(2)	....	....	....
Spain	9,775	7,960	8,134	4,248	2,179	383	2,509
Sweden	1,476	2,195	8,292	2,023	1,212	1,374	3,199
Switzerland	3,987	3,068	4,461	4,767	3,241	652	5,274
United Kingdom	82,976	75,499	92,226	68,759	53,802	32,275	38,987
United States	1,226	15,821	6,499	2,155	1,654	1,990	11,213
Other countries	3,495	4,866	5,003	4,241	1,983	926	....
Total	270,991	182,455	237,744	177,143	109,364	71,676	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 bushels.

WHEAT.

TABLE 16.—*Wheat: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	47,097	53,541	60,469	52,316	45,089	59,181	72,308	57,192
Canada:								
Quebec	70	55	71	64	277	366	251	222
Ontario	850	834	1,093	865	770	714	981	1,030
Manitoba	2,861	2,616	2,800	2,726	2,449	2,984	2,880	2,706
Saskatchewan	4,894	5,348	8,929	9,032	8,273	9,249	10,587	10,061
Alberta	1,201	1,371	2,138	2,605	2,897	3,892	4,283	4,074
Other	69	70	78	78	90	149	144	139
Total	9,945	10,294	15,109	15,370	14,756	17,354	19,126	18,232
Mexico	2,628	....	....	....	....	....	....	....
Total North America	59,670	....	....	....	....	....	....	....
SOUTH AMERICA.								
Argentina	15,799	16,243	15,471	16,420	16,089	17,875	16,976	14,957
Chile	1,021	1,018	1,074	1,143	1,272	1,302	1,313	....
Uruguay	734	911	783	950	780	976	840	721
Total	17,554	18,172	17,328	18,513	18,141	20,153	19,129	....
EUROPE.								
Austria	[2] 3,011	[3] 1,660	[3] 1,588	[4] 2,008	411	400	371	....
Hungary proper [2]	8,284	8,016	8,288	....	....	....	....	2,081
Belgium	395	400	....	....	....	....	329	282
Bulgaria [2]	2,764	2,638	2,408	2,220	2,481	2,445	[5] 2,080	[5] 2,154
Czecho-Slovakia	....	....	....	....	....	....	[6] 816	1,494
Denmark	123	134	164	152	131	140	124	165
Finland	....	....	....	....	....	....	19	19
France [2]	16,308	14,975	13,564	12,429	10,357	10,993	[7] 11,515	[7] 11,995
Alsace-Lorraine	341	333	299	....	....	....	257	....
Germany [2]	4,768	4,932	4,950	[7] 3,950	[7] 3,573	[7] 3,547	[7] 3,162	[7] 3,427
Greece	[8] 868	844	847	[9] 895	[10] 1,045	....	936	....
Italy	11,746	11,783	12,502	11,679	10,556	10,788	10,571	11,292
Jugo-Slavia	....	....	....	....	....	....	3,380	3,952
Luxemburg	27	27	22	20	22	23	....	....
Netherlands	138	148	163	136	122	118	168	156
Norway	12	14	14	14	20	41	41	41
Portugal	1,180	....	929	929	685	806	133	....
Roumania [2]	4,576	5,218	4,705	4,844	....	[11] 5,684	[12] 4,271	[13] 5,156
Russia proper [2]	50,388	83,862	77,238	42,028	....	....	....	....
Poland [2]	1,260	[14] 343	....	....	....	....	[15] 1,407	[16] 2,044
Serbia [2]	874	....	....	....	....	....	....	....
Spain	9,547	9,681	10,037	10,148	10,340	10,228	10,378	10,050
Sweden	255	269	299	307	329	381	345	360
Switzerland	156	113	114	124	139	203	130	119
United Kingdom:								
England	1,748	1,770	2,122	1,862	1,855	2,461	2,150	1,825
Wales	44	37	49	50	64	96	71	51
Scotland	52	61	77	63	61	79	80	55
Ireland	43	37	87	76	124	157	70	50
Total	1,887	1,905	2,335	2,051	2,101	2,793	2,371	1,981
Total Europe	118,968	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Galicia and Bukowina not included.
[4] Includes Galicia, but excludes Bukowina, Goritz, and Gradisca.
[5] New boundaries.
[6] Bohemia and Moravia only.
[7] Excludes Alsace-Lorraine.
[8] 1914.
[9] Excludes Macedonia.
[10] Excludes eastern Macedonia.
[11] Excludes Dobrudja.
[12] Former Kingdom, Bessarabia, and Bukowina.
[13] Former Kingdom, Bessarabia, Bukowina, and Transylvania.
[14] Winter wheat, 5 governments only.
[15] Includes Congress Poland, Western Galicia, Eastern Galicia, and Posen.
[16] Unofficial

WHEAT—Continued.

TABLE 16.—*Wheat: Area and production in undermentioned countries, 1909–1920*—Con.

AREA—Continued.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
ASIA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
British India [2]	29,114	28,475	32,475	30,320	32,940	35,487	23,797	29,975
Cyprus	....	....	....	....	....	....	....	....
Japanese Empire:								
Japan	1,179	1,174	1,227	1,304	1,393	1,390	1,355	1,335
Formosa	14	16	16	14	13	....	....	....
Chosen (Korea)	369	474	499	520	560	....	....	....
Persia	....	....	....	....	....	....	....	....
Russia:								
Central Asia [3] (4 governments)	3,767	5,501	5,421	....	....	....	....	....
Siberia [3] (4 governments)	5,987	7,931	7,727	....	....	....	....	....
Transcaucasia [3] (1 government)	10	11	10	....	....	....	....	....
Total Russia	9,764	13,443	13,158	....	....	....	....	....
Turkey (Asiatic)	....	....	....	....	....	....	....	....
Total Asia	40,449	....	....	....	....	....	....	....
AFRICA.								
Algeria	3,371	3,368	3,209	3,272	3,222	3,186	2,800	2,647
Egypt	1,311	1,301	1,592	1,447	1,116	1,286	1,323	1,190
Tunis	1,193	1,010	1,112	1,482	1,310	1,413	1,400	1,211
Union of South Africa	....	725	725	785	755	925	953	801
Total	5,875	6,404	6,638	6,986	6,403	6,810	6,476	5,849
AUSTRALASIA.								
Australia:								
Queensland	95	132	127	94	228	128	22	37
New South Wales	2,025	3,205	2,758	4,189	3,807	3,329	2,410	1,451
Victoria	2,105	2,566	2,864	3,680	3,126	2,690	2,214	1,918
South Australia	1,993	2,268	2,502	2,739	2,778	2,356	2,186	1,922
Western Australia	544	1,097	1,376	1,734	1,567	1,250	1,145	1,075
Tasmania	36	18	24	49	28	22	12	10
Other	....	....	....	....	1	....	1	....
Total	6,798	9,286	9,651	12,485	11,535	9,775	7,990	6,413
New Zealand	258	167	230	329	218	281	208	193
Total Australasia	7,056	9,453	9,881	12,814	11,753	10,056	8,198	6,606
Grand total	249,593	....	....	....	....	....	....	....

PRODUCTION.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	686,691	891,017	1,025,801	636,318	636,655	921,438	934,265	787,128
Canada:								
Quebec	1,168	990	1,411	960	3,884	6,308	4,206	3,775
Ontario	18,633	17,658	30,252	17,931	16,318	15,241	20,698	22,973
Manitoba	53,174	38,605	69,337	29,667	41,040	48,191	40,975	37,542
Saskatchewan	97,954	73,494	224,312	147,559	117,921	92,493	89,994	113,135
Alberta	21,783	28,859	66,538	65,088	52,992	23,752	34,575	83,461
Other	1,407	1,674	1,692	1,576	1,588	3,090	2,812	2,303
Total	197,119	161,280	393,543	262,781	233,713	189,075	193,260	263,189
Mexico	9,995	1,389	4,000	....	....	[4] 10,470	[4] 14,239	[4] 14,951
Total	893,805	1,056,686	1,423,343	....	....	1,120,983	1,141,764	1,065,268

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Includes some native States.
[3] Old boundaries.
[4] Unofficial.

WHEAT—Continued.

TABLE 16.—*Wheat: Area and production in undermentioned countries, 1909–1920*—Con.

PRODUCTION—Continued.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
SOUTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Argentina	157,347	113,904	169,166	172,620	80,115	184,000	171,591	214,140
Chile	20,316	16,403	19,000	20,184	22,498	23,120	21,591	21,845
Uruguay	7,314	5,887	3,596	9,867	5,390	13,060	6,890	5,416
Total	184,977	136,194	191,762	202,671	108,003	220,180	200,072	241,401
EUROPE.								
Austria	[2] 61,075	[3] 38,024	[3] 28,286	[4] 27,811	5,993	5,159	5,114	....
Hungary proper [2]	156,523	105,237	152,934	....	[5] 115,530	....	....	[6] 29,139
Belgium	14,583	13,973	8,000	....	[5] 8,252	[5] 6,189	9,895	7,948
Bulgaria [2]	43,725	23,200	36,940	27,764	33,294	25,341	[6] 34,028	[6] 41,189
Czecho-Slovakia	....	....	....	....	....	....	[7] 14,942	24,453
Denmark	4,916	5,785	7,978	6,044	4,296	6,331	5,923	6,944
Finland	129	196	260	246	....	....	306	272
France [2]	317,254	282,689	222,776	204,908	134,575	225,736	[8] 182,444	[8] 230,404
Alsace-Lorraine	8,009	6,700	5,508	....	....	2,952	4,589	....
Germany [2]	152,119	145,944	141,676	[8] 110,207	[8] 81,791	[8] 85,865	[8] 79,701	[8] 78,924
Greece	[9] 7,200	7,000	6,000	[10] 8,106	[11] 11,505	....	9,693	13,287
Italy	183,260	169,581	170,541	176,530	139,999	183,294	169,769	141,337
Jugo Slavia	....	....	....	....	....	....	50,956	64,712
Luxemburg	615	530	387	377	388	512	....	....
Netherlands	4,976	5,779	7,090	4,035	3,452	5,431	6,015	6,677
Norway	307	269	285	317	432	1,087	1,071	1,035
Portugal	8,683	10,000	6,571	7,343	5,560	8,252	....	....
Roumania [2]	86,679	49,270	89,241	78,520	....	[12] 18,447	[13] 66,060	[14] 41,815
Russia proper [2]	522,794	833,639	826,784	....	....	....	....	....
Poland	[2] 23,343	....	....	....	....	....	[15] 20,760	[6] 25,610
Serbia [2]	14,775	9,000	10,000	....	....	[5] 4,126	....	....
Spain	130,446	116,089	139,298	152,329	142,674	135,709	129,250	138,606
Sweden	7,907	8,472	9,170	8,979	6,864	9,003	9,509	11,123
Switzerland	3,314	3,277	3,957	4,053	4,556	7,905	3,524	3,586
United Kingdom:								
England	56,411	59,217	68,437	54,941	57,397	83,957	61,824	52,184
Wales	1,117	1,082	1,421	1,466	1,726	2,938	1,984	1,232
Scotland	2,345	2,642	3,053	2,336	2,510	3,317	3,064	2,080
Ireland	1,608	1,415	3,339	2,916	4,717	5,867	2,452	1,402
Total	61,481	64,356	76,250	61,659	66,350	96,079	69,324	56,898
Total Europe	1,806,104	....	....	....	....	....	....	....
ASIA.								
British India [16]	350,736	312,032	376,731	3[illegible],008	282,069	370,421	280,485	376,884
Cyprus	2,286	2,500	1,924	....	....	....	[5] 1,861	[5] 3,000
Japanese Empire:								
Japan	25,274	22,975	26,778	30,047	34,739	32,923	29,800	28,055
Formosa	173	195	161	138	125	....	....	....
Chosen (Korea)	4,871	5,848	6,146	6,387	6,540	6,655	7,141	....
Persia	16,000	14,000	16,000	....	....	....	....	....
Russia:								
Central Asia [2] (4 governments)	29,292	68,448	44,132	....	....	....	....	....
Siberia [2] (4 governments)	54,737	104,038	50,308	....	....	....	....	....
Transcaucasia [2] (1 government)	110	82	126	....	....	....	....	....
Total Russia	84,139	172,568	94,566	....	....	....	....	....
Turkey (Asiatic)	35,000	....	....	....	....	....	....	....
Total Asia	518,479	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] Includes Galicia and excludes Bukowina, Goritz, and Gradisca.
[5] Unofficial.
[6] New boundaries.
[7] Bohemia and Moravia only.
[8] Excludes Alsace-Lorraine.
[9] 1914.
[10] Excludes Macedonia.
[11] Excludes Eastern Macedonia.
[12] Excludes Dobrudja.
[13] Former Kingdom, Bessarabia, and Bukowina.
[14] Former Kingdom and Bessarabia.
[15] Includes Congress Poland, Eastern and Western Galicia, and Posen.
[16] Includes some native states.

WHEAT—Continued.

Table 16.—*Wheat: Area and production in undermentioned countries, 1909–1920*—Con.

PRODUCTION—Continued.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
AFRICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Algeria	33,071	30,000	34,654	29,151	23,151	49,774	25,559	13,902
Egypt	34,000	32,831	39,144	36,543	29,834	32,555	30,137	27,246
Tunis	6,063	2,205	11,023	7,165	6,963	8,451	7,349	4,766
Union of South Africa	4,620	6,034	7,076	4,857	4,790	8,833	8,983	6,630
Total	77,754	71,070	91,897	77,716	64,738	99,613	72,028	52,544
AUSTRALASIA.								
Australia:								
Queensland	1,250	1,825	1,635	427	2,463	1,035	104	287
New South Wales	26,717	39,219	13,235	68,869	36,598	37,705	18,325	4,297
Victoria	27,656	33,974	4,065	60,366	51,162	37,738	25,240	14,858
South Australia	22,843	17,470	3,639	35,210	45,745	28,693	22,937	14,947
Western Australia	5,671	13,751	2,707	18,811	16,103	9,304	8,845	12,270
Tasmania	806	361	396	1,025	348	252	187.	141
Other	....	....	....	1	14	7	....	1
Total	84,943	106,600	25,677	184,709	152,433	114,734	75,638	46,801
New Zealand	7,885	5,559	6,854	7,332	5,083	6,888	6,568	4,100
Total Australasia	92,828	112,159	32,531	192,041	157,516	121,622	82,206	50,901
Grand total	3,573,947	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.

Table 17.—*Wheat: World production so far as reported, 1891–1916.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1891	2,432,322,000	1898	2,948,305,000	1905	3,327,084,000	1912	3,791,951,000
1892	2,481,805,000	1899	2,783,885,000	1906	3,434,354,000	1913	4,127,437,000
1893	2,559,174,000	1900	2,610,751,000	1907	3,133,965,000	1914	3,585,916,000
1894	2,660,557,000	1901	2,955,975,000	1908	3,182,105,000	1915	4,127,685,000
1895	2,593,312,000	1902	3,090,116,000	1909	3,581,519,000	1916	3,701,333,000
1896	2,506,320,000	1903	3,189,813,000	1910	3,575,055,000	....	....
1897	2,236,268,000	1904	3,163,542,000	1911	3,551,795,000	....	....

Table 18.—*Wheat: Average yield per acre in undermentioned countries, 1890–1920.*

Year.	United States.[1]	Russia (European).[1]	Germany.[1]	Austria.[1]	Hungary proper.[1]	France.[2]	United Kingdom.[2]
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels:*
1890–1899	13.2	8.9	24.5	16.2	....	18.6	31.2
1900–1909	14.1	9.7	28.9	18.0	17.5	20.5	33.1
1910–1914	14.8	10.3	31.7	20.8	18.6	19.1	32.4
1906	15.5	7.7	30.3	20.3	22.5	20.2	34.8
1907	14.0	8.0	29.6	18.0	14.9	23.2	35.1
1908	14.0	8.8	29.7	21.0	17.5	19.6	33.4
1909	15.4	12.5	30.5	19.9	14.1	22.0	35.0
1910	13.9	11.2	29.6	19.2	19.8	15.9	31.4
1911	12.5	7.0	30.6	19.6	20.9	19.8	34.0
1912	15.9	10.3	33.6	22.3	19.8	21.0	30.0
1913	15.2	13.5	35.1	19.9	19.6	19.9	32.7
1914	16.6	9.4	29.6	22.9	13.1	18.9	33.8
1915	17.0	11.6	28.6	17.8	18.4	16.6	32.7
1916	12.2	10.4	28.0	13.8	....	16.5	30.0
1917	14.1	....	22.9	....	....	[1] 13.8	31.5
1918	15.6	....	25.4	....	....	20.8	33.3
1919	12.8	....	....	....	....	15.9	29.2
1920	14.0	....	....	....	....	....	....

[1] Bushels of 60 pounds. [2] Winchester bushels.

WHEAT—Continued.

TABLE 19.—*Wheat: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage harvested (000 omitted).	Average yield per acre.	Production (000 omitted).	Average farm price per bushel Dec. 1.	Farm value Dec. 1 (000 omitted).	Chicago cash price per bushel, No. 1 northern spring. December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports including flour, fiscal year beginning July 1.	Imports including flour, fiscal year beginning July 1.	Per cent of crop exported.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*	*Bushels.*	*P.ct.*
1849..			100,486							7,535,901		7.5
1859..			173,105							17,213,133	1,565,791	9.9
1866..	15,424	9.9	152,000	152.7	232,110	129	145	185	211	12,646,941	3,092,400	8.3
1867..	18,322	11.6	212,441	145.2	308,387	126	140	134	161	26,323,014	2,014,328	12.4
1868..	18,460	12.1	224,037	108.5	243,033	80	88	87	96	29,717,201	1,830,393	13.3
1869..	19,181	13.6	260,147	76.5	199,025	63	76	79	92	53,900,780	1,285,976	20.7
1869..			287,746									
1870..	18,993	12.4	235,885	94.4	222,767	91	98	113	120	52,574,111	867,489	22.3
1871..	19,944	11.6	230,722	114.5	264,076	107	111	120	143	38,995,755	2,410,738	16.9
1872..	20,858	12.0	249,997	111.4	278,522	97	108	112	122	52,014,715	1,841,049	20.8
1873..	22,172	12.7	281,255	106.9	300,670	96	106	105	114	91,510,398	2,116,777	32.5
1874..	24,967	12.3	308,103	86.3	265,881	78	83	78	94	72,912,817	367,987	23.7
1875..	26,382	11.1	292,136	89.5	261,397	82	91	89	100	74,750,682	1,664,138	25.6
1876..	27,627	10.5	289,356	97.0	280,743	104	117	130	172	57,043,936	366,061	19.7
1877..	26,278	13.9	364,194	105.7	385,089	103	108	98	113	92,141,626	1,390,713	25.3
1878..	32,109	13.1	420,122	77.6	325,814	81	84	91	102	150,502,506	2,074,321	35.8
1879..	32,546	13.8	448,757	110.8	497,030	122	133½	112½	119	180,304,181	488,687	40.2
1879..	35,430	13.0	459,483									
1880..	37,987	13.1	498,550	95.1	474,202	93⅛	109¾	101	112⅜	186,321,514	212,600	37.4
1881..	37,709	10.2	383,280	119.2	456,880	124¾	129	123	140	121,892,389	865,467	31.8
1882..	37,067	13.6	504,185	88.4	445,602	91⅛	94¾	108	113⅜	147,811,316	1,087,011	29.3
1883..	36,456	11.6	421,086	91.1	383,649	94⅜	99¼	85	94¾	111,534,182	32,474	26.5
1884..	39,476	13.0	512,765	64.5	330,862	69½	76⅛	85⅜	90¾	132,570,366	212,312	25.9
1885..	34,189	10.4	357,112	77.1	275,320	82⅞	89	72⅛	79	94,565,793	388,415	26.5
1886..	36,806	12.4	457,218	68.7	314,226	75⅛	79½	80¾	88¾	153,804,969	282,400	33.6
1887..	37,642	12.1	456,329	68.1	310,613	75⅛	79¼	81¼	89⅜	119,625,344	594,860	26.2
1888..	37,336	11.1	415,868	92.6	385,248	96⅜	105½	77¼	95½	88,600,743	135,851	21.3
1889..	38,124	12.9	490,560	69.8	342,492	76¾	80½	89¾	100	109,430,467	162,546	22.3
1889..	33,580	13.9	468,374									
1890..	36,087	11.1	399,262	83.8	334,774	87½	92¾	98⅞	108¼	106,181,316	583,826	26.6
1891..	39,917	15.3	611,781	83.9	513,473	89⅜	93¼	80	85¼	225,665,811	2,462,365	36.9
1892..	38,554	13.4	515,947	62.4	322,112	69½	73	68¼	76¼	191,912,635	968,125	37.2
1893..	34,629	11.4	396,132	53.8	213,171	59⅛	64½	52⅛	60½	164,283,129	1,182,864	41.5
1894..	34,882	13.2	460,267	49.1	225,902	52¾	63⅜	60¾	85⅜	144,812,718	1,438,399	31.5
1895..	34,047	13.7	467,103	50.9	237,939	53¾	64¾	57⅛	67⅝	126,443,968	2,116,303	27.1
1896..	34,619	12.4	427,684	72.6	310,598	74⅜	93⅛	68¾	97⅞	145,124,972	1,544,242	33.9
1897..	39,465	13.4	530,149	80.8	428,547	92	109	117	185	217,306,005	2,058,938	41.0
1898..	44,055	15.3	675,149	58.2	392,770	62¾	70	68¾	79½	222,618,420	1,875,173	33.0
1899..	44,593	12.3	547,304	58.4	319,545	64	69½	63⅜	67½	186,096,762	320,194	34.0
1899..	52,589	12.5	658,534									
1900..	42,495	12.3	522,230	61.9	323,515	69¼	74¾	70	75⅛	215,990,073	603,101	41.4
1901..	49,896	15.0	748,460	62.4	467,360	73	79½	72⅛	76¼	234,772,516	120,502	31.4
1902..	46,202	14.5	670,063	63.0	422,224	71¾	77¾	74¾	80¾	202,905,598	1,080,128	30.3
1903..	49,465	12.9	637,822	69.5	443,025	77¾	87	87¾	101⅛	120,727,613	217,682	18.9
1904..	44,075	12.5	552,400	92.4	510,490	115	122	89½	113¾	44,112,910	3,286,189	8.0
1905..	47,854	14.5	692,979	74.8	518,373	82½	90	80¼	87¼	97,609,007	261,908	14.1
1906..	47,306	15.5	735,261	66.7	490,333			84	106	146,700,425	590,092	20.0
1907..	45,211	14.0	634,087	87.4	554,437					163,043,669	519,785	25.7
1908..	47,557	14.0	664,602	92.8	616,826	106½	112	126½	137	114,268,468	456,940	17.2
1909..	46,723	15.8	737,189									
1909..	44,262	15.4	683,379	98.6	668,680	106	119¾	100	119¼	87,364,318	815,617	12.8
1910[1].	45,681	13.9	635,121	88.3	561,051	104	110	98	106	69,311,760	1,146,558	10.9
1911..	49,543	12.5	621,338	87.4	543,063	105	110	115	122	79,689,404	3,413,626	12.8
1912..	45,814	15.9	730,267	76.0	555,280	85	90¾	90½	96	142,879,596	1,282,039	19.6
1913..	50,184	15.2	763,380	79.9	610,122	89½	93	96	100	145,590,349	2,383,537	19.1
1914..	53,541	16.6	891,017	98.6	878,680	115	131	141	164½	332,464,975	715,369	37.3
1915..	60,469	17.0	1,025,801	91.9	942,303	106	128½	116	126	243,117,026	7,187,650	23.7
1916..	52,316	12.2	636,318	160.3	1,019,968	155½	190	258	340	203,573,928	24,924,985	32.0
1917..	45,089	14.1	636,655	200.8	1,278,112	220	220	220	220	132,578,633	31,215,213	20.8
1918..	59,181	15.6	921,438	204.2	1,881,826	220	220	245	280	287,401,579	11,288,591	31.2
1919..	72,308	12.9	934,265	215.1	2,009,407	280	325	295	345	219,861,398	5,495,516	23.5
1920..	57,192	13.8	787,128	144.3	1,135,806	164	187					

[1] Figures adjusted to census basis.

WHEAT—Continued.

TABLE 20.—*Wheat: Revised acreage, production, and farm value, 1879, and 1889–1909.*

[See head note of Table 5.]

Year.	Acreage harvested.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1879	*35,430,000*	14.1	496,435,000	110.6	549,219,000
1889	*33,580,000*	12.9	434,383,000	69.5	301,869,000
1890	34,048,000	11.1	378,097,000	83.3	315,112,000
1891	37,826,000	15.5	584,504,000	83.4	487,463,000
1892	39,552,000	13.3	527,986,000	62.2	328,329,000
1893	37,934,000	11.3	427,553,000	53.5	228,599,000
1894	39,425,000	13.1	516,485,000	48.9	252,709,000
1895	40,848,000	13.9	569,456,000	50.3	286,539,000
1896	43,916,000	12.4	544,193,000	71.7	390,346,000
1897	46,046,000	13.3	610,254,000	80.9	493,683,000
1898	51,007,000	15.1	772,163,000	58.2	449,022,000
1899	*52,589,000*	12.1	636,051,000	58.6	372,982,000
1900	51,387,000	11.7	602,708,000	62.0	373,578,000
1901	52,473,000	15.0	789,538,000	62.6	494,096,000
1902	49,649,000	14.6	724,528,000	63.0	456,530,000
1903	51,632,000	12.9	664,543,000	69.5	461,605,000
1904	47,825,000	12.5	596,375,000	92.4	551,128,000
1905	49,389,000	14.7	726,384,000	74.6	542,119,000
1906	47,800,000	15.8	757,195,000	66.2	501,355,000
1907	45,116,000	14.1	637,981,000	86.5	552,074,000
1908	45,970,000	14.0	644,656,000	92.2	594,092,000
1909	*44,262,000*	15.8	700,434,000	98.4	689,108,000

TABLE 21.—*Winter and spring wheat: Acreage (sown and harvested), production, and farm value Dec. 1, by States in 1920, and United States totals, 1890–1919.*

[000 omitted, except in yield and price columns.]

State.	Winter wheat.						Spring wheat.				
	Acreage sown in preceding fall.	Acreage harvested.	Average yield per acre.	Production.	Average farm price Dec. 1.	Total farm value Dec. 1.	Acreage.	Average yield per acre.	Production.	Average farm price Dec. 1.	Total farm value Dec. 1.
	Acres.	*Acres.*	*Bush.*	*Bush.*	*Cts.*	*Dollars.*	*Acres.*	*Bush.*	*Bush.*	*Cts.*	*Dollars.*
Me.	....	....	....	....	....	....	7	22.7	159	230	366
Vt.	....	....	....	....	....	....	11	19.0	209	200	418
N. Y.	467	460	22.3	10,258	175	17,952	40	18.5	740	175	1,295
N. J.	105	95	16.0	1,520	205	3,116	....	....	....	....	....
Pa.	1,555	1,500	16.6	24,900	170	42,330	24	16.0	384	170	653
Del.	125	120	17.0	2,040	171	3,488	....	....	....	....	....
Md.	700	670	17.0	11,390	165	18,794	....	....	....	....	....
Va.	942	914	12.5	11,425	180	20,565	....	....	....	....	....
W. Va.	354	340	12.5	4,250	190	8,075	....	....	....	....	....
N. C.	730	724	11.7	8,471	210	17,789	....	....	....	....	....
S. C.	165	160	11.0	1,760	255	4,488	....	....	....	....	....
Ga.	222	211	10.0	2,110	240	5,064	....	....	....	....	....
Ohio	2,476	2,229	12.7	28,308	165	46,708	30	13.0	390	165	644
Ind.	2,170	1,950	12.0	23,400	167	39,078	10	14.0	140	167	234
Ill.	2,600	2,350	15.2	35,720	161	57,509	300	16.5	4,950	161	7,970
Mich.	922	890	15.5	13,795	168	23,176	48	10.0	480	168	806
Wis.	91	91	22.0	2,002	154	3,083	250	12.6	3,150	154	4,851
Minn.	70	60	19.6	1,176	130	1,529	2,941	9.5	27,940	130	36,322
Iowa	458	431	19.7	8,491	141	11,972	400	11.3	4,520	135	6,102
Mo.	2,820	2,600	12.5	32,500	160	52,000	17	13.0	221	160	354

WHEAT—Continued.

TABLE 21.—*Winter and spring wheat: Acreage (sown and harvested), production, and farm value Dec. 1, by States in 1920, and United States totals, 1890–1919*—Continued.

State.	Winter wheat.						Spring wheat.				
	Acreage sown in preceding fall.	Acreage harvested.	Average yield per acre.	Production.	Average farm price Dec. 1.	Total farm value Dec. 1.	Acreage.	Average yield per acre.	Production.	Average farm price Dec. 1.	Total farm value Dec. 1.
	Acres.	*Acres.*	*Bush.*	*Bush.*	*Cts.*	*Dollars.*	*Acres.*	*Bush.*	*Bush.*	*Cts.*	*Dollars.*
N. Dak.							7,600	9.0	68,400	130	88,920
S. Dak.	66	56	14.5	812	115	934	2,830	9.0	25,470	115	29,290
Nebr.	3,368	3,335	17.4	58,029	131	76,018	258	9.5	2,451	131	3,211
Kans.	10,554	8,886	15.4	136,844	130	177,897	17	12.5	212	130	276
Ky.	625	550	10.2	5,610	191	10,715					
Tenn.	470	424	9.5	4,028	195	7,855					
Ala.	70	68	9.6	653	230	1,502					
Miss.	15	10	10.0	100	213	213					
Tex.	1,310	1,225	13.0	15,925	172	27,391					
Okla.	3,100	2,890	16.0	46,240	135	62,424					
Ark.	132	126	9.5	1,197	190	2,274					
Mont.	450	300	13.0	3,900	128	4,992	1,450	11.0	15,950	128	20,416
Wyo.	73	69	20.0	1,380	135	1,863	185	20.0	3,700	135	4,995
Colo.	1,000	950	18.1	17,195	135	23,213	290	19.4	5,626	135	7,595
N. Mex.	258	225	19.0	4,275	140	5,985	105	20.0	2,100	140	2,940
Ariz.	45	36	24.0	864	262	2,264					
Utah	168	156	15.0	2,340	153	3,580	124	24.4	3,026	153	4,630
Nev.	3	3	25.0	75	180	135	15	23.0	345	180	621
Idaho	445	400	20.0	8,000	125	10,000	650	24.0	15,600	125	19,500
Wash.	1,035	828	24.3	20,120	135	27,162	1,501	11.9	17,862	135	24,114
Oreg.	815	791	22.2	17,560	130	22,828	316	16.9	5,340	130	6,942
Calif.	780	650	14.0	9,100	180	16,380					
U. S.	41,757	37,773	15.3	577,763	149.3	862,341	19,419	10.8	209,365	130.6	273,465
1919	50,489	49,105	14.9	729,503	210.9	1,538,292	23,203	8.8	204,762	230.1	471,115
1918	42,301	37,130	15.2	565,099	206.3	1,165,995	22,051	16.2	356,339	200.9	715,831
1917	40,534	27,257	15.1	412,901	202.8	837,237	17,832	12.5	223,754	197.0	440,875
1916	39,203	34,709	13.8	480,553	162.7	781,906	17,607	8.8	155,765	152.8	238,062
1915	42,881	41,308	16.3	673,947	94.7	638,149	19,161	18.4	351,854	86.4	304,154
1914	37,128	36,008	19.0	684,990	98.6	675,623	17,533	11.8	206,027	98.6	203,057
1913	33,618	31,699	16.5	523,561	82.9	433,995	18,485	13.0	239,819	73.4	176,127
1912	33,215	26,571	15.1	399,919	80.9	323,572	19,243	17.2	330,348	70.1	231,708
1911	32,648	29,162	14.8	430,656	88.0	379,151	20,381	9.1	190,682	86.0	163,912
1910	31,656	27,329	15.9	434,142	88.1	382,318	18,352	11.0	200,979	88.9	178,783
1909[1]	29,301	*27,151*	*15.5*	*419,733*	102.4	426,184	*17,111*	15.4	263,646	92.5	242,496
1908	31,646	30,349	14.4	437,908	93.7	410,330	17,208	13.2	226,694	91.1	206,496
1907	31,665	28,132	14.6	409,442	88.2	361,217	17,079	13.2	224,645	86.0	193,220
1906	31,312	29,600	16.7	492,888	68.3	336,435	17,706	13.7	242,373	63.5	153,898
1905	31,155	29,864	14.3	428,463	78.2	334,987	17,990	14.7	264,517	69.3	183,386
1904	31,654	26,866	12.4	332,935	97.8	325,611	17,209	12.8	219,464	84.2	184,879
1903	31,071	32,511	12.3	399,867	71.6	286,243	16,954	14.0	237,955	65.9	156,782
1902	32,432	28,581	14.4	411,789	64.8	266,727	17,621	14.7	258,274	60.2	155,497
1901	30,283	30,240	15.2	458,835	66.1	303,227	19,656	14.7	289,626	56.7	164,133
1900	30,883	26,236	13.3	350,025	63.3	221,668	16,259	10.6	172,204	59.1	101,817
1899	29,951	25,358	11.5	291,706	63.0	183,767	19,235	13.3	255,598	53.1	135,778
1898	27,642	25,715	14.9	382,492	62.2	237,736	18,310	16.0	292,657	53.0	155,034
1897	24,765	22,926	14.1	323,616	85.1	275,323	16,539	12.5	206,533	74.2	153,224
1896	23,383	22,794	11.8	267,934	77.0	206,270	11,825	13.5	159,750	65.3	104,328
1895	21,224	22,609	11.6	261,242	57.8	150,944	11,438	18.0	205,861	42.3	86,995
1894	21,553	23,519	14.0	329,290	49.8	164,022	11,364	11.5	130,977	47.2	61,880
1893		23,118	12.0	278,469	56.3	156,720	11,511	10.2	117,662	48.0	56,151
1892		26,209	13.7	359,416	65.1	234,037	12,315	12.7	156,531	56.3	88,075
1891		27,524	14.7	405,116	88.0	356,115	12,393	16.7	206,665	76.0	157,058
1890	21,359	23,520	10.9	255,371	87.5	223,362	12,567	11.4	143,890	77.4	111,411

[1] Census acreage (harvested) and production.

WHEAT—Continued.

Table 22.—*Winter and spring wheat: Yield per acre, in States producing both, for 10 years.*

WINTER WHEAT.

State.	Yield per acre (bushels).										
	10-year aver., 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
New York								21.0	18.0	22.0	22.3
Pennsylvania									17.0	17.5	16.6
Ohio								22.0	19.0	19.0	12.7
Indiana								18.5	21.0	15.0	12.0
Illinois								18.5	21.5	17.0	15.2
Michigan								18.0	14.0	20.3	15.5
Wisconsin	20.7	17.5	19.5	20.1	21.5	23.0	19.0	24.0	21.2	19.6	22.0
Minnesota	17.5			16.2	19.5	19.5	14.0	18.0	18.0	15.0	19.6
Iowa	20.3	19.7	23.0	23.4	21.6	21.5	18.5	17.5	20.5	17.4	19.7
Missouri								15.3	17.2	13.5	12.5
South Dakota	15.1			9.0	14.0	20.5	18.5	14.0	17.0	13.0	14.5
Nebraska	16.4	13.8	18.0	18.6	19.3	18.5	20.0	12.0	11.1	14.8	17.4
Kansas	14.0	10.8	15.5	13.0	20.5	12.5	12.0	12.2	14.1	13.8	15.4
Montana	19.7	31.7	24.5	25.6	23.0	27.0	21.5	13.0	12.7	5.2	13.0
Wyoming	22.6	26.0	28.0	25.0	24.0	26.0	21.0	20.0	24.0	12.0	20.0
Colorado	19.7	18.0	24.5	21.1	25.0	26.0	20.0	23.0	10.5	11.2	18.1
New Mexico	18.6	25.0	20.0	18.6	25.0	22.0	16.5	10.0	10.0	20.0	19.0
Utah	19.3	20.0	24.0	23.0	25.0	25.0	20.0	14.0	16.6	10.5	15.0
Nevada	25.3	23.0	27.5	23.0	29.0	26.0	24.5	26.0	29.0	20.0	25.0
Idaho	24.7	31.5	28.7	27.4	27.5	29.0	24.0	18.0	22.0	18.5	20.0
Washington	25.1	27.3	27.6	27.0	26.5	27.6	26.5	21.5	23.5	19.4	24.3
Oregon	21.7	22.2	26.8	21.4	22.0	24.0	23.0	17.5	17.0	21.2	22.2
United States	15.6	14.8	15.1	16.5	19.0	16.3	13.8	15.1	15.2	14.9	15.3

SPRING WHEAT.

State.	10-year aver., 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
New York								21.0	20.0	15.0	18.5
Pennsylvania									17.0	15.0	16.0
Ohio									21.5	16.0	13.0
Indiana								20.0	23.0	9.5	14.0
Illinois								25.0	26.9	10.5	16.5
Michigan								17.7	18.0	11.2	10.6
Wisconsin	17.9	14.5	18.5	18.6	17.0	22.5	16.6	21.2	24.7	12.4	12.5
Minnesota	13.4	10.1	15.5	16.2	10.5	17.0	7.5	17.5	21.0	9.3	9.3
Iowa	15.1	13.8	17.0	17.0	13.5	16.7	13.0	21.5	18.0	9.5	11.0
Missouri								9.0	15.6	8.5	13.0
South Dakota	11.0	4.0	11.2	9.0	9.0	17.0	6.3	14.0	19.0	8.0	9.0
Nebraska	12.2	10.0	14.1	12.0	11.5	16.0	12.5	16.5	11.9	8.5	9.5
Kansas	10.1	4.2	15.0	8.5	15.0	12.0	10.5	6.0	8.0	9.3	12.5
Montana	16.8	25.2	23.5	21.5	17.0	26.0	18.0	9.0	12.5	4.6	11.0
Wyoming	23.4	26.0	29.2	25.0	22.0	27.0	22.0	22.0	26.0	15.0	20.0
Colorado	20.1	19.5	24.0	21.0	22.5	21.0	19.5	22.0	17.5	14.5	19.4
New Mexico	21.4	20.5	22.0	19.0	23.0	22.5	21.5	18.0	21.0	24.0	20.0
Utah	24.9	27.0	29.2	28.0	25.0	28.0	25.0	25.0	26.8	14.0	24.4
Nevada	28.7	32.5	30.2	31.0	30.0	32.0	31.5	28.0	25.0	23.5	23.0
Idaho	24.4	29.0	28.3	28.0	21.0	26.5	23.5	22.0	21.0	18.0	24.0
Washington	17.1	19.5	20.4	19.0	20.0	22.2	21.5	13.6	9.5	13.6	11.9
Oregon	16.5	17.7	19.5	19.5	16.5	17.0	23.0	11.0	11.0	12.9	16.9
United States	12.7	9.4	17.2	13.0	11.8	18.4	8.8	12.5	16.2	8.8	10.8

WHEAT—Continued.

TABLE 23.—*Wheat: Acreage, production, and total farm value, by States, 1919 and 1920.*

State.	Thousands of acres.		Production (thousands of bushels).		Total value, basis Dec. 1 price (thousands of dollars).	
	1920	1919	1920	1919	1920	1919
Maine	7	8	159	150	366	330
Vermont	11	11	209	176	418	400
New York	500	524	10,998	11,178	19,247	24,032
New Jersey	95	109	1,520	1,962	3,116	4,316
Pennsylvania	1,524	1,664	25,284	29,055	42,983	62,758
Delaware	120	130	2,040	1,560	3,488	3,323
Maryland	670	785	11,390	10,598	18,794	22,786
Virginia	914	1,060	11,425	12,508	20,565	28,018
West Virginia	340	400	4,250	5,400	8,075	11,880
North Carolina	724	768	8,471	6,067	17,789	14,136
South Carolina	160	185	1,760	1,942	4,488	5,010
Georgia	211	240	2,110	2,520	5,064	6,628
Ohio	2,259	2,848	28,698	53,932	47,352	114,336
Indiana	1,960	2,835	23,540	42,332	39,312	88,897
Illinois	2,650	4,075	40,670	64,562	65,479	135,580
Michigan	938	1,035	14,275	20,237	23,982	42,497
Wisconsin	341	552	5,152	7,392	7,934	15,893
Minnesota	3,001	3,865	29,116	36,315	37,851	90,788
Iowa	831	1,580	13,011	22,515	18,074	45,030
Missouri	2,617	4,445	32,721	59,833	52,354	125,051
North Dakota	7,600	8,000	68,400	55,200	88,920	133,032
South Dakota	2,886	3,725	26,282	30,175	30,224	72,420
Nebraska	3,593	4,384	60,480	60,675	79,229	122,564
Kansas	8,903	11,030	137,056	152,079	178,173	326,970
Kentucky	550	900	5,610	10,350	10,715	21,838
Tennessee	424	700	4,028	6,650	7,855	14,763
Alabama	68	138	653	1,242	1,502	3,043
Mississippi	10	36	100	504	213	1,260
Texas	1,225	2,045	15,925	33,742	27,391	67,484
Oklahoma	2,890	3,860	46,240	54,040	62,424	110,782
Arkansas	126	280	1,197	2,660	2,274	5,373
Montana	1,750	2,250	19,850	10,650	25,408	25,028
Wyoming	254	250	5,080	3,540	6,858	7,505
Colorado	1,240	1,388	22,821	16,615	30,808	33,562
New Mexico	330	251	6,375	5,344	8,925	10,688
Arizona	36	38	864	950	2,264	2,138
Utah	280	294	5,366	3,542	8,210	7,438
Nevada	18	24	420	550	756	1,177
Idaho	1,050	1,050	23,600	19,075	29,500	39,104
Washington	2,329	2,441	37,982	39,305	51,276	84,113
Oregon	1,107	1,115	22,900	20,808	29,770	44,113
California	650	990	9,100	16,335	16,380	33,323
United States	57,192	72,308	787,128	934,265	1,135,806	2,009,407

WHEAT—Continued.

TABLE 24.—*Wheat: Production and distribution in the United States, 1897–1920.*

[000 omitted, except in weight and quality columns.]

Year.	Old stock on farms July 1.	Crop. Quantity.	Crop. Weight per bushel.	Crop. Quality.	Total supplies.	Stock on farms Mar. 1. following	Shipped out of county where grown.
	Bushels.	*Bushels.*	*Pounds.*	*Per cent.*	*Bushels.*	*Bushels.*	*Bushels.*
1897	23,347	530,149	57.1	....	553,496	121,320	269,126
1898	17,839	675,149	57.7	87.9	692,988	198,056	398,882
1899	61,061	547,304	56.9	83.7	611,365	158,746	305,020
1900	50,900	522,230	56.3	87.8	573,130	128,098	281,372
1901	30,552	748,460	57.5	88.8	779,012	173,353	372,717
1902	52,437	670,063	57.6	....	722,500	164,047	388,554
1903	42,540	637,822	57.3	....	680,362	132,608	369,582
1904	36,634	552,400	57.4	....	589,034	111,055	302,771
1905	24,257	692,979	55.5	....	717,236	158,403	404,092
1906	46,053	735,261	58.3	....	781,314	206,642	427,253
1907	54,853	634,087	58.2	89.9	688,940	148,721	367,607
1908	33,797	664,602	58.3	89.4	698,399	143,692	393,435
1909	15,062	683,379	57.9	90.4	698,441	159,100	414,166
1910	35,680	635,121	58.5	93.1	670,801	162,705	352,906
1911	34,071	621,338	57.8	88.3	655,409	122,041	348,739
1912	23,876	730,267	58.3	90.0	754,143	156,471	449,881
1913	35,515	763,380	58.7	93.2	798,895	151,795	411,733
1914	32,236	891,017	58.0	89.7	923,253	152,903	541,193
1915	28,972	1,025,801	57.9	88.4	1,054,773	244,448	633,380
1916	74,731	636,318	57.1	87.0	711,049	100,650	361,088
1917	15,611	636,655	58.5	92.4	652,266	107,745	325,500
1918	8,063	921,438	58.8	93.1	929,501	128,703	541,666
1919	19,261	934,265	56.3	82.1	953,526	164,624	563,687
1920	47,620	787,128	57.4	88.9	834,748	....	....

TABLE 25.—*Wheat: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels.) 10-year average, 1911-1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	Farm price per bushel (cents). 10-year average, 1911-1920.	1916	1917	1918	1919	1920	Value per acre (dollars).[1] 5-year average, 1915-1919.	1920
Me	23.0	21.0	23.5	25.5	27.0	28.0	27.0	14.0	22.0	18.8	22.7	164	187	235	237	220	230	41.65	52.21
Vt	23.8	27.8	25.0	24.5	29.0	30.0	25.0	20.0	22.0	16.0	19.0	156	165	236	231	227	200	41.54	38.06
N. Y	20.6	19.5	16.0	20.0	22.5	25.0	21.0	21.0	18.2	21.3	22.0	148	168	210	215	215	175	37.91	38.50
N. J	18.2	17.4	18.5	17.6	18.0	20.0	20.0	19.0	17.0	18.0	16.0	152	164	213	215	220	205	34.12	32.80
Pa	17.3	13.5	18.0	17.0	18.1	18.5	19.0	17.5	17.0	17.5	16.6	145	162	205	214	216	170	32.02	28.22
Del	15.8	16.7	17.5	14.5	20.5	15.0	15.0	16.5	13.0	12.0	17.0	147	162	208	222	213	171	25.88	29.07
Md	16.0	15.5	15.0	13.3	21.5	16.1	16.0	17.0	15.5	13.5	17.0	146	171	207	219	215	165	28.48	28.05
Va	12.8	12.0	11.6	13.6	14.5	13.8	12.7	13.0	12.0	11.8	12.5	151	165	216	219	224	180	23.33	22.50
W. Va	13.8	11.5	1[illegible].5	13.0	15.0	15.0	14.5	14.0	14.2	13.5	12.5	153	160	217	221	220	190	26.17	23.75
N. C	10.1	10.6	8.9	11.7	12.0	10.9	10.5	10.0	7.0	7.9	11.7	164	176	234	230	233	210	17.89	21.57
S. C	10 9	11.4	9.2	12.3	11.5	10.8	10.6	10.5	11 0	10.5	11.0	191	189	290	260	258	255	24.21	28.05
Ga	10.7	12.0	9.3	12.2	12.1	11.0	11.4	8.5	10.2	10.5	10.0	186	186	290	266	263	240	22.96	24.00
Ohio	16.7	16.0	8.0	18.0	18.5	20.3	13.5	22.0	19.0	18.9	12.7	145	169	204	212	212	165	33.83	20.96
Ind	15.4	14.7	8.0	18.5	17.4	17.2	12.0	18.5	21.0	14.9	12.0	143	169	203	208	210	167	30.07	20.04
Ill	16.3	16.0	8.3	18.7	18.5	19.0	11.0	18.7	22.1	15.8	15.3	141	165	201	208	210	161	30.78	24.63
Mich	16.8	18.0	10.0	15.3	19.7	21.3	16.6	18.0	14.2	19.6	15.2	144	167	204	209	210	168	31.36	25.54
Wis	18.9	15.9	19.0	19.3	19.1	22.7	17.6	22.3	24.2	13.4	15.1	139	160	202	205	215	154	34.64	23.25
Minn	13.4	10.1	15.5	16.2	10.6	17.0	7.6	17.5	20.9	9.4	9.7	138	162	202	204	250	130	25.82	12.61
Iowa	18.0	16.4	19.8	20.6	18.6	20.0	16.3	19.9	18.9	14.2	15.7	132	156	199	200	200	139	29.73	21.82
Mo	14.2	15.7	12.5	17.1	17.0	12.3	8.5	15.3	17.2	13.5	12.5	139	165	195	205	209	160	23.88	20.00

[1] Based upon farm price Dec. 1.

WHEAT—Continued.

TABLE 25.—*Wheat: Yield per acre, price per bushel Dec. 1, and value per acre, by States*—Continued.

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).	
	10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911–1920.	1916	1917	1918	1919	1920	5-year average, 1915–1919.	1920
N. Dak.	10.9	8.0	18.0	10.5	11.2	18.2	5.5	8.0	13.6	6.9	9.0	134	152	200	203	241	130	16.89	11.70
S. Dak.	11.0	4.0	14.2	9.0	9.1	17.1	6.8	14.0	19.0	8.1	9.1	131	150	196	199	240	115	21.92	10.46
Nebr.	16.1	13.4	17.6	17.9	18.6	18.3	19.4	13.8	11.2	13.8	16.8	129	160	195	197	202	131	24.65	22.01
Kans.	14.0	10.7	15.5	13.0	20.5	12.5	12.0	12.2	14.1	13.8	15.4	133	164	198	199	215	130	22.54	20.02
Ky.	12.0	12.7	10.0	13.6	16.5	11.0	9.0	12.0	13.0	11.5	10.2	149	166	212	214	211	191	20.80	19.48
Tenn.	10.8	11.5	10.5	12.0	15.5	10.5	9.5	9.2	10.0	9.5	9.5	153	169	222	214	222	195	18.06	18.52
Ala.	10.6	11.5	10.6	11.7	13.0	12.0	9.5	10.0	9.0	9.0	9.6	177	185	270	245	245	230	20.74	22.08
Miss.	14.2	12.0	12.0	14.0	13.0	20.0	15.0	15.0	16.5	14.0	10.0	171	175	300	250	250	213	33.70	21.30
Tex.	13.3	9.4	15.0	17.5	13.0	15.5	11.0	12.0	10.0	16.5	13.0	146	173	210	215	200	172	23.06	22.36
Okla.	12.5	8.0	12.8	10.0	19.0	11.6	9.7	11.5	12.6	14.0	16.0	133	167	194	210	205	135	20.57	21.60
Ark.	11.4	10.5	10.0	13.0	13.0	12.5	8.0	16.0	12.0	9.5	9.5	144	163	201	207	202	190	20.37	18.05
Mont.	18.2	28.7	24.1	23.8	20.2	26.5	19.3	10.4	12.6	4.7	11.3	129	161	192	194	235	128	21.44	14.46
Wyo.	23.2	26.0	28.7	25.0	22.9	26.5	21.6	21.2	25.4	14.2	20.0	129	115	200	189	212	135	34.50	27.00
Colo.	19.7	18.9	24.2	21.0	23.8	24.2	19.8	22.6	12.3	12.0	18.4	128	150	193	195	202	135	28.18	21.84
N. Mex.	19.8	22.9	20.9	18.8	24.2	22.2	18.6	12.7	16.7	21.3	19.3	138	150	215	210	200	140	30.57	27.02
Ariz.	27.7	29.6	30.7	32.0	28.0	28.0	29.0	25.0	26.0	25.0	21.0	164	150	210	240	225	262	49.37	62.88
Utah.	21.5	22.3	25.7	24.2	25.0	25.7	21.2	19.1	20.2	12.0	19.2	127	152	178	188	210	153	30.30	29.38
Nev.	27.3	28.3	29.2	27.7	29.6	29.6	28.9	27.8	25.5	22.9	23.3	139	140	180	206	214	180	41.03	41.94
Idaho.	24.7	30.7	28.6	27.6	26.2	28.0	23.8	20.3	21.3	18.2	22.5	121	146	182	192	205	125	31.46	28.12
Wash.	20.4	22.7	23.5	23.2	23.5	25.7	23.7	15.8	13.1	16.1	16.3	128	143	193	196	214	135	29.12	22.00
Oreg.	20.2	21.0	25.0	21.0	20.8	22.2	23.0	14.5	14.7	18.7	20.7	128	145	182	201	212	130	29.52	26.91
Calif.	16.3	18.0	17.0	14.0	17.0	16.0	16.0	19.8	15.0	16.5	14.0	143	152	200	216	204	180	29.04	25.20
U. S.	14.6	12.5	15.9	15.2	16.6	17.0	12.2	14.1	15.6	12.9	13.8	135.8	160.3	200.8	204.2	215.1	144.3	24.60	19.86

TABLE 26.—*Winter and spring wheat: Condition of crop, United States, on first of months named, 1899–1920.*

Year.	Winter wheat.					Spring wheat.			
	December of previous year.	April.	May.	June.	When harvested.	June.	July.	August.	When harvested.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1900	97.1	82.1	88.9	82.7	80.8	87.3	55.2	56.4	56.1
1901	97.1	91.7	94.1	87.8	88.3	92.0	95.6	80.3	78.4
1902	86.7	78.7	79.4	76.1	77.0	95.4	92.4	89.7	87.2
1903	99.7	97.3	92.6	82.2	78.8	95.9	82.5	77.1	78.1
1904	86.6	76.5	76.5	77.7	78.7	93.4	93.7	87.5	66.2
1905	82.9	91.6	92.5	85.5	82.7	93.7	91.0	89.2	87.3
1906	94.1	89.1	90.9	82.7	85.6	93.1	91.4	86.9	83.4
1907	94.1	89.9	82.9	77.4	78.3	88.7	87.2	79.4	77.1
1908	91.1	91.3	89.0	86.0	80.6	95.0	89.4	80.7	77.6
1909	85.3	82.2	83.5	80.7	82.4	95.2	92.7	91.6	88.6
1910	95.8	80.8	82.1	80.0	81.5	92.8	61.6	61.0	63.1
1911	82.5	83.3	86.1	80.4	76.8	94.6	73.8	59.8	56.7
1912	86.6	80.6	79.7	74.3	73.3	95.8	89.3	90.4	90.8
1913	93.2	91.6	91.9	83.5	81.6	93.5	73.8	74.1	75.3
1914	97.2	95.6	95.9	92.7	94.1	95.5	92.1	75.5	68.0
1915	88.3	88.8	92.9	85.8	84.4	91.9	93.3	93.4	91.6
1916	87.7	78.3	82.4	73.2	75.7	88.2	89.0	63.4	48.6
1917	85.7	63.4	73.2	70.9	75.9	91.6	83.6	68.7	71.2
1918	79.3	78.6	86.4	83.8	79.5	95.2	86.1	79.6	82.1
1919	98.6	99.8	100.5	94.9	89.0	91.2	80.9	53.9	48.5
1920	85.2	75.6	79.1	78.2	79.7	89.1	88.0	73.4	64.1
1921	87.9	......	......	......	......	......	......	......	......

WHEAT—Continued.

TABLE 27.—*Winter wheat: Per cent of area sown which was abandoned (not harvested).*

Year.	Per cent.	Year.	Per cent.	Year.	Per cent.
1903	2.8	1909	7.5	1915	2.7
1904	15.4	1910	13.7	1916	11.4
1905	4.6	1911	10.7	1917	31.0
1906	5.5	1912	20.1	1918	13.7
1907	11.2	1913	4.7	1919	1.1
1908	4.2	1914	3.1	1920	11.9

TABLE 28.—*Wheat: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	12.3	6.2	0.4	1.3	0.8	2.9	0.3	24.3	10.2	2.5	0.1	(1)	37.6
1918	14.6	.3	.1	3.8	1.1	2.0	.2	22.4	1.5	1.1	.3	.1	25.7
1917	19.1	.4	.1	11.8	1.0	1.6	.2	34.4	.7	.7	.1	.1	36.3
1916	6.9	3.8	.6	5.1	1.3	2.7	.2	21.2	12.6	4.0	.1	.1	38.7
1915	1.3	7.3	1.0	1.2	1.6	.1	.4	13.0	2.4	3.6	.1	.1	19.7
1914	6.7	1.4	.1	1.1	1.0	2.7	.2	13.4	3.0	2.6	.1	.1	19.8
1913	14.2	.4	.2	1.9	.7	1.7	.3	20.0	.3	2.2	.1	.1	23.5
1912	8.1	1.8	.3	9.5	1.5	1.8	.4	24.0	1.8	2.3	.3	.2	29.5
1911	25.5	.8	(1)	1.5	.4	3.8	.1	32.3	1.9	1.9	.2	.2	37.8
1910	18.9	.9	.2	6.6	.5	2.6	.2	30.0	.9	1.9	.4	.4	33.8
1909	8.5	3.2	.7	2.4	2.0	1.2	.6	18.9	1.6	1.1	.2	.3	22.8
Average	12.4	2.0	.3	4.5	1.1	2.0	.3	22.9	2.7	2.1	.2	.2	28.8

[1] Less than 0.05 per cent.

TABLE 29.—*Wheat: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	231.8	204.8	201.9	150.3	102.8	107.8	81.0	76.2	88.0	88.6	133.3
Feb. 1	235.7	207.5	201.2	164.8	113.9	129.9	81.6	79.9	90.4	89.8	139.5
Mar. 1	226.6	208.0	202.7	164.4	102.9	133.6	83.1	80.6	90.7	85.4	137.8
Apr. 1	234.0	214.2	202.6	180.0	98.6	131.7	84.2	79.1	92.5	83.8	140.1
May 1	251.3	231.1	203.6	245.9	102.5	139.6	83.9	80.9	99.7	84.6	152.3
June 1	258.5	228.4	202.5	248.5	100.0	131.5	84.1	82.7	102.8	86.3	152.5
July 1	253.6	222.0	203.2	220.1	93.0	102.8	76.9	81.4	99.0	84.3	143.6
Aug. 1	232.2	217.2	204.5	228.9	107.1	106.5	76.5	77.1	89.7	82.7	142.2
Sept. 1	218.7	205.7	205.6	209.7	131.2	95.0	93.3	77.1	85.8	84.8	140.7
Oct. 1	214.3	209.6	205.8	200.6	136.3	90.9	93.5	77.9	83.4	88.4	140.1
Nov. 1	188.0	213.2	206.0	200.0	158.4	93.1	97.2	77.0	83.8	91.5	140.8
Dec. 1	144.3	215.1	204.2	200.8	160.3	91.9	98.6	79.9	76.0	87.4	135.8
Average	217.2	212.8	204.3	200.8	125.9	105.2	88.4	78.4	87.4	86.9	140.7

WHEAT—Continued.

TABLE 30.—*Wheat: Monthly marketings by farmers, 1914–1920.*

Month.	Estimated amount sold monthly by farmers of United States (millions of bushels).						Per cent of year's sales.					
	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15
July	137	136	41	83	60	141	17.1	17.6	7.4	13.3	7.1	17.5
August	186	154	69	111	94	106	23.2	19.9	12.4	17.9	11.0	13.2
September	125	139	108	104	122	125	15.6	18.0	19.3	16.8	14.4	15.5
October	89	107	101	87	123	100	11.1	13.8	18.0	14.1	14.5	12.5
November	60	67	77	60	105	83	7.5	8.7	13.7	9.7	12.4	10.3
December	45	56	43	35	94	60	5.7	7.3	7.6	5.6	11.0	7.5
January	34	36	26	45	58	41	4.2	4.6	4.7	7.2	6.8	5.1
February	24	24	22	20	58	46	3.0	3.1	3.9	3.3	6.8	5.7
March	23	16	21	24	32	26	2.9	2.0	3.7	3.9	3.8	3.3
April	25	13	23	19	33	37	3.1	1.6	4.1	3.1	3.9	4.6
May	27	15	17	19	40	22	3.4	1.9	3.1	3.0	4.7	2.7
June	25	12	12	13	31	17	3.2	1.5	2.1	2.1	3.6	2.1
Season	800	775	560	620	851	804	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 31.—*Durum wheat production: Receipts at primary markets, and exports, 1905–1918.*

Year.	Production in 4 States.[1]	Receipts at 7 primary markets.[2]	Exports, year beginning July 1.	Year.	Production in 4 States.[1]	Receipts at 7 primary markets.[2]	Exports, year beginning July 1.
	Bushels.	*Bushels.*	*Bushels.*		*Bushels.*	*Bushels.*	*Bushels.*
1905			7,015,225	1912	[3] 31,561,000	22,539,000	15,461,129
1906			22,638,565	1913	[3] 21,529,000	20,625,000	11,785,000
1907		31,600,604	27,053,478	1914	[3] 18,103,000	21,356,600	15,229,401
1908		32,600,569	20,777,435	1915	40,365,000	43,867,120	24,780,169
1909	38,115,000	34,762,000	18,344,972	1916	[3] 10,887,000	22,503,511	17,385,073
1910	[3] 24,131,000	19,764,000	3,273,703	1917	25,945,000	16,087,974	6,587,795
1911	[3] 16,024,000	5,830,000	1,851,988	1918	49,414,000	33,311,793	18,329,257

[1] These 4 States are: Minnesota, North Dakota, South Dakota, Montana.
[2] These 7 markets are: Chicago, Duluth, Kansas City, Milwaukee, Minneapolis, Omaha, St. Louis.
[3] Does not include Montana.

WHEAT—Continued.

TABLE 32.—*Spring wheat varieties: Production in principal States, 1914–1920.*

The bulk of the spring wheat crop is produced in the four States of Minnesota, North and South Dakota, and Montana. The five leading varieties of spring wheat in these States have made interesting shifts in relative importance in the past seven years. Marquis was least important in 1914, but by 1916 it had jumped into first place, which it has held since, although its peak of popularity seems to have been reached in 1919, when it comprised 58.3 per cent of all the spring wheat raised in these four States, as compared with 57 per cent in 1920. Durum wheat is the only one of the leading varieties that has gained, relatively, in 1920. This variety has been gaining, relatively, steadily since 1914. It is the heaviest yielder in bushels per acre. Velvet chaff, blue stem, and fife have each lost in relative importance each year since 1916. Comparative figures are given below.

State and year.	Marquis.	Velvet chaff.	Blue stem.	Durum.	Fife.	Other.
	Per cent of State total.					
Minnesota:	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
1920	72.3	14.4	6.0	5.2	1.2	0.9
1919	67.8	17.8	7.9	4.3	1.4	.8
1918	59.7	22.4	11.8	3.3	1.6	1.2
1917	47.4	26.8	18.6	3.1	3.1	1.0
1916	31.7	29.9	31.9	2.3	3.9	.3
1914	3.1	30.6	53.1	2.0	7.1	4.1
North Dakota:						
1920	46.7	8.1	3.9	36.4	3.3	1.6
1919	47.5	8.0	5.0	34.6	4.3	.6
1918	47.2	9.1	7.0	29.2	6.0	1.5
1917	43.4	10.1	12.1	25.3	8.1	1.0
1916	38.5	12.2	14.2	18.6	16.0	.5
1914	5.0	11.6	44.6	12.7	21.5	4.6
South Dakota:						
1920	61.9	6.3	1.9	28.0	.6	1.2
1919	63.8	8.4	3.1	22.7	1.0	1.0
1918	59.6	12.5	5.5	20.4	1.6	.4
1917	44.3	20.6	11.4	20.6	3.1	....
1916	25.4	32.1	25.8	13.6	2.9	.2
1914	3.1	32.0	30.9	21.7	11.3	1.0
Montana:						
1920	66.8	2.5	5.0	17.8	3.1	4.7
1919	71.4	4.3	4.6	13.3	3.9	2.5
1918	66.2	2.8	5.6	21.2	2.8	1.4
1917	75.0	1.7	5.0	13.3	3.3	1.7
Four States:						
1920	57.0	8.4	4.1	26.4	2.4	1.7
1919	58.3	10.6	5.3	22.2	2.7	.9
1918	55.2	13.1	7.9	19.2	3.5	1.1
1917	47.0	17.6	13.6	16.2	4.9	.8
State and year.	Production in bushels.					
Minnesota:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1920	20,189	4,020	1,678	1,446	347	260
1919	23,960	6,290	2,792	1,520	495	283
1918	44,506	16,699	8,797	2,460	1,193	895
1917	23,807	13,460	9,342	1,557	1,557	502
1916	8,084	7,625	8,135	586	994	76
1914	1,302	12,852	22,302	840	2,982	1,722
North Dakota:						
1920	31,943	5,540	2,668	24,898	2,257	1,091
1919	26,220	4,416	2,760	19,099	2,374	331
1918	49,877	9,616	7,397	30,856	6,341	1,585
1917	24,304	5,656	6,776	14,168	4,536	560
1916	15,140	4,798	5,584	7,314	6,292	197
1914	4,111	9,425	36,395	10,389	17,549	3,723
South Dakota:						
1920	15,760	1,610	493	7,140	156	311
1919	18,630	2,453	905	6,628	292	292
1918	36,237	7,600	3,344	12,403	973	243
1917	19,226	8,940	4,948	8,941	1,345	0
1916	5,601	7,078	5,689	2,999	639	44
1914	900	9,888	9,388	6,724	3,501	199
Montana:						
1920	10,661	397	794	2,843	502	753
1919	5,748	346	370	1,071	314	201
1918	14,101	596	1,193	4,516	596	298
1917	8,235	187	549	1,460	362	187
Four States:						
1920	78,553	11,567	5,633	36,327	3,262	2,418
1919	74,558	13,505	6,827	28,318	3,475	1,107
1918	144,721	34,511	20,731	50,235	9,103	3,021
1917	75,572	28,213	21,615	25,126	7,809	1,249

WHEAT—Continued.

TABLE 32.—*Spring wheat varieties: Production in principal States, 1914–1920*—Con.

State and year.	Marquis.	Velvet chaff.	Blue stem.	Durum.	Fife.	Other.
	Yield per acre.					
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
Minnesota:						
1920	9.8	8.1	7.9	12.0	9.6	10.8
1919	9.7	8.3	7.8	11.9	8.8	9.5
1918	22.4	19.0	17.0	20.0	17.6	18.0
1917	17.2	16.0	14.0	15.5	15.0	14.0
1916	11.0	7.4	5.5	8.5	6.9	....
1914	12.8	11.6	9.8	12.3	10.3	11.0
North Dakota:						
1920	8.5	7.4	7.2	10.5	8.8	11.6
1919	6.6	6.8	5.3	7.9	5.8	7.8
1918	13.2	12.0	11.0	14.0	11.0	12.0
1917	8.0	7.5	7.2	9.0	7.0	6.8
1916	6.0	5.2	3.8	7.3	4.5	5.0
1914	14.9	12.1	10.3	13.9	10.9	10.8
South Dakota:						
1920	8.2	7.3	8.1	12.4	9.2	11.5
1919	7.6	7.4	6.7	9.8	7.1	8.8
1918	19.3	17.0	15.4	19.5	16.0	16.5
1917	15.3	13.1	11.1	15.6	10.0	....
1916	7.9	6.2	5.0	8.2	5.0	....
1914	11.2	9.3	7.5	11.2	9.3	8.7
Montana:						
1920	10.8	10.4	10.7	11.5	10.7	12.3
1919	4.8	5.4	5.8	4.5	4.2	4.4
1918	13.0	12.7	10.5	12.9	10.8	13.3
1917	9.3	7.5	6.5	9.0	7.5	7.5

TABLE 33.—*Wheat: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York.			Baltimore.			Chicago.			Detroit.			St. Louis.			Minneapolis.			San Francisco.		
	No. 1 northern spring.[1]			No. 2 red.			No. 1 northern spring.[2]			No. 2 red.[3]			No. 2 red winter.			No. 1 northern			White (per 100 lbs.).[4]		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January–June	107	114½	111.2	105¾	109½	107.0	87¼	96	91.9	102½	116¼	....	93	115	106.3	82⅛	95	88.3	147½	182½	157.7
July–December	94	107	98.0	89¼	96½	92.4	85	95¼	90.8	87½	102½	....	83	97¾	91.6	80¾	93½	86.7	145	172½	150.0
1914.																					
January–June	87½	111¾	101.4	83	103	98.1	89	100	95.2	86¼	99¼	....	75¾	99½	94.0	84⅝	98¼	91.5	151¼	165	172.7
July–December	86¼	136½	114.0	82¾	127	106.6	88½	133	112.9	80	127¾	....	76	127½	105.2	85½	129⅛	110.0	152	200	173.1
1915.																					
January–June	126	178	157.1	111	168½	148.0	123	167	150.7	114½	165	147.3	110	164	145.2	114⅞	165⅝	146.5	165	240	213.1
July–December	108¼	144½	123.6	100¾	127⅞	112.5	99	153¾	117.6	106	132	114.5	106	129	118.0	89	155	115.1	140	185	162.1
1916.																					
January–June	113¾	156¼	136.6	100¼	141¼	118.8	106½	139½	122.1	103	137	119.8	106	143	123.6	106½	138¾	120.6	150	190	166.2
July–December	123½	215	179.5	102½	193¼	156.6	110	202	162.0	104	189½	156.3	109	196	162.2	107⅞	200	164.0	160	290	219.5
1917.																					
January–June	197	320	241.1	168½	342	234.2	162½	340	230.3	171	340	233.7	171	342	238.1	166⅜	339	229.0	250	500	329.5
July–December	229	231	229.4	209	240	223.7	217	300	234.3	215	255	223.0	210	273	221.2	215	305	231.8	330	390	351.8
1918.																					
January–June	228	229	228.2	222	227	226.0	220	220	220.0	217	219	217.5	215	215	215.0	215	217	216.5	350	350	350.0
July–December	229	240½	239.5	230	235¾	235.7	226	234	227.6	217	230	223.5	221	248½	224.2	221½	238	225.1	350	350	350.0
1919.																					
January–June	237½	240½	240½	233¾	248	238.1	223	292	240.8	230	270	243.7	235	278	252.2	221½	289	240.9	350	350	350.0
July–December	236½	240½	238.7	235¾	235¾	235.8	220	325	268.9	223	255	229.8	221	257	228.7	230	320	271.0	([5])	([5])	([5])
1920.																					
January	234½	234½	234.8	235¾	264	248.7	290	350	317.7	249	265	260.1	260	284	271.6	260	325	294.8	([5])	([5])	([5])
February	234½	234½	234.5	235¾	235¾	235.8	235	278	249.9	250	265	253.6	240	277	255.1	221½	295	260.8	([5])	([5])	([5])
March	234½	285	252.8	235¾	235¾	235.8	250	290	262.4	245	260	249.8	250	268	258.8	250	300	271.9	([5])	([5])	([5])
April	285	315	305.6	235¾	307	278.9	275	305	293.3	260	298	278.7	264	293	282.2	275	315	301.4	([5])	([5])	([5])
May	290	328	313.5	300	325	310.8	295	345	326.9	298	320	308.7	283	312	297.2	280	330	309.0	([5])	([5])	([5])
June	294	312	301.4	300	316	304.9	280	313	294.6	295	315	301.6	275	299	285.5	270	310	291.8	([5])	([5])	([5])
January–June	234½	328	273.8	235¾	325	269.2	235	350	290.8	245	320	275.4	240	312	275.1	221½	330	288.3	([5])	([5])	([5])
July	262	305	292.3	285	307	300.5	237	300	280.6	240	295	284.1	224	291	274.5	235	300	282.6	400	440	420.0
August	237	273½	263.8	260	275½	270.3	240	286	261.7	230	258	250.7	222	262	252.8	225	290	258.3	340	430	366.6
September	249	281½	268.1	251½	277½	267.3	228½	274	254.7	231	268	253.7	235	268	257.5	225½	268½	250.8	350	380	368.8
October	217	248	233.1	218½	248	232.0	196¼	231½	215.7	211	224	218.8	215	236	226.9	197½	228¾	212.9	350	400	383.5
November	178¼	234¾	206.5	180	232½	203.0	158	224	185.6	192	205	201.5	183	226	203.9	146⅜	226	175.5	325	375	352.6
December	183¼	207	195.7	183½	201	196.3	164	187	175.5	195	209	199.4	186	208	199.8	154	182⅛	167.5	265	350	292.2
July–December	178¼	305	243.2	180	307	244.9	158	300	229.0	192	295	231.7	183	291	235.9	146⅜	300	224.6	265	440	364.0

[1] No. 2 red winter, 1913–1915; No. 2 hard winter, Mar. 20 to December, 1920. [2] No. 2 northern, 1919. [3] No. 1 red winter, 1920. [4] Northern club in 1913. [5] Basic.

WHEAT—Continued.

TABLE 34.—*Wheat flour: Wholesale price per barrel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago.						Cincinnati.			New York.			St. Louis.		
	Winter patents.			Spring patents.			Winter patents.			Spring patents.			Winter patents.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
January–June	[illegible].30	5.10	.....	4.10	5.60	.....	3.25	4.15	.....	4.40	5.00	.....	4.30	5.15	.....
July–December	3.90	4.35	.....	4.00	5.50	.....	2.90	3.50	.....	4.40	5.00	.....	3.70	4.55	.....
1914.															
January–June	3.50	4.40	.....	4.00	5.50	.....	3.20	3.50	.....	4.50	5.10	.....	3.35	4.35	.....
July–December	3.45	5.50	.....	4.00	6.90	.....	3.05	4.90	.....	4.35	7.00	.....	3.35	5.70	.....
1915.															
January–June	5.10	7.80	.....	5.50	6.75	.....	4.75	6.65	.....	5.50	8.25	.....	5.10	7.50	.....
July–December	4.50	5.75	.....	4.50	6.90	.....	4.65	5.65	.....	4.90	7.25	.....	4.60	5.90	.....
1916.															
January–June	5.00	6.80	.....	5.00	6.85	.....	4.50	5.50	.....	5.45	7.25	.....	4.75	6.10	.....
July–December	5.10	8.65	.....	5.20	9.75	.....	4.50	8.75	.....	5.50	10.00	.....	4.75	9.00	.....
1917.															
January–June	8.10	17.00	.....	8.20	17.80	.....	7.25	15.25	.....	8.65	16.75	.....	7.90	15.25	.....
July–December	9.85	12.50	.....	10.20	14.00	.....	9.50	11.50	.....	10.45	13.75	.....	9.80	11.75	.....
1918.															
January–June	10.10	11.25	10.65	10.10	11.75	10.96	10.70	11.35	10.98	10.55	11.25	10.87	10.00	12.50	10.74
July–December	9.80	10.90	10.60	9.80	11.72	11.10	10.35	11.25	10.89	10.50	11.95	11.06	8.89	11.65	9.70
1919.															
January–June	10.00	12.90	11.28	10.40	15.00	11.75	10.50	13.25	11.52	10.35	13.25	11.60	9.50	12.65	11.02
July–December	9.30	13.00	10.96	10.00	14.00	12.27	10.75	12.50	11.32	11.25	15.00	12.86	9.40	12.00	10.17
1920.															
January	10.85	14.25	12.61	12.75	15.60	14.08	11.75	12.75	12.34	13.50	15.50	14.50	11.25	13.00	12.06
February	11.00	13.75	11.84	12.70	14.75	13.59	11.75	12.75	12.38	12.25	14.75	13.19	10.75	12.25	11.51
March	11.00	14.00	12.11	12.75	13.85	13.26	11.75	12.25	12.00	12.50	13.50	13.07	10.00	12.50	11.56
April	11.00	14.00	13.40	13.25	14.75	14.22	11.75	12.50	12.12	12.75	15.00	13.86	9.60	14.50	12.31
May	12.75	14.00	13.57	14.25	15.50	14.74	12.00	15.00	13.50	13.75	15.75	11.76	11.00	15.60	13.85
June	12.25	13.00	12.76	14.50	15.00	14.80	13.25	13.75	13.50	13.25	15.50	11.33	12.00	14.90	13.11
January–June	10.85	14.25	12.72	12.70	15.60	14.12	11.75	15.00	12.64	12.25	15.75	13.95	9.60	15.60	12.40
July	12.25	13.00	12.74	12.25	13.00	12.74	13.25	13.75	13.50	12.50	14.75	13.93	10.25	13.75	12.11
August	10.75	12.75	11.54	10.75	12.75	12.47	12.75	13.00	12.88	12.00	14.00	13.03	10.25	13.20	11.83
September	11.50	13.00	11.90	12.75	13.50	13.26	12.75	13.00	12.88	11.75	13.50	12.81	10.50	13.50	12.09
October	10.75	11.75	10.92	10.50	13.00	11.35	12.25	12.50	12.34	10.75	12.50	11.33	9.75	13.50	11.02
November	7.30	11.00	9.31	7.90	11.00	9.46	11.25	12.25	11.88	8.25	11.25	9.82	8.50	12.50	10.29
December	7.30	8.25	8.20	8.50	8.75	8.69	10.75	11.25	10.98	8.25	9.75	9.15	8.75	10.00	9.16
July–December	7.30	13.00	10.77	7.90	13.50	11.33	10.75	13.75	12.41	8.25	14.75	11.68	8.50	13.75	11.14

WHEAT—Continued.

TABLE 35.—*Wheat, including flour: International trade, calendar years, 1909–1919.*[1]

["Temporary" imports into Italy of wheat to be used for manufacturing products for export are included in the total imports as given in the official Italian return. In the trade returns of Chile the item trigo mote (prepared corn) which might easily be confused with trigo (wheat) is omitted. See "General note," Table 15.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Argentina	95,243	39,435	98,155	91,625	40,078	119,029	137,356
Australia	49,732	6,668	35,369	68,780	40,159	66,760	....
Austria-Hungary	906	....	....	....	....	....	....
Belgium	22,694	....	....	....	....	....	847
British India	51,510	29,204	29,207	27,323	57,822	24,144	2,524
Bulgaria	11,244	....	....	....	....	....	....
Canada	90,871	91,322	176,959	226,862	186,342	93,247	113,586
Chile	2,593	301	16	535	1,098	4,370	....
Germany	21,149	....	....	....	....	....	....
Netherlands	54,394	37,583	1,830	44	776	21	264
Roumania	52,370	23,535	....	....	....	....	1
Russia	161,766	94,342	11,885	15,134	....	....	....
United States	100,310	231,323	27 ,40	218,755	168,864	208,857	267,111
Other countries	30,412	33,387	23,275	112,138	18,380	35,533	....
Total	745,194	587,100	653,102	761,196	513,519	551,961	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Belgium	73,967	....	....	....	....	....	4,256
Brazil	20,495	20,808	20,142	21,553	12,618	18,499	22,404
British South Africa	6,397	6,767	5,168	5,822	3,898	1,824	2,030
Denmark	6,711	5,424	4,226	3,648	1,649	353	....
Finland	4,912	4,548	4,460	6,984	....	....	....
France	38,698	65,598	76,776	106,446	87,517	72,627	86,630
Germany	89,755	....	....	....	....	....	....
Greece	7,034	6,704	6,772	8,323	3,165	....	....
Italy	52,866	37,399	83,159	74,088	77,249	78,671	95,503
Japan	3,495	4,976	910	687	301	2,874	....
Netherlands	76,653	57,951	28,766	30,242	12,575	2,245	18,259
Portugal	3,228	5,439	4,827	6,789	2,321	....	....
Spain	4,471	15,575	13,691	11,648	1,861	4,664	13,426
Sweden	7,140	5,346	9,934	9,862	3,673	2,402	4,073
Switzerland	18,885	17,272	18,109	22,177	9,957	7,406	13,148
United Kingdom	219,156	218,025	191,064	211,830	206,255	175,460	178,543
United States	1,537	2,069	5,149	9,407	36,474	17,788	7,986
Other countries	65,126	61,717	46,978	30,786	29,112	133,149	....
Total	700,526	535,618	520,131	560,292	488,625	517,962	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

OATS.

Table 36.—*Oats: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	37,357	38,442	40,996	41,527	43,553	44,349	41,835	43,323
Canada:								
New Brunswick	204	200	201	198	190	224	305	309
Quebec	1,451	1,327	1,400	1,073	1,493	1,933	2,141	2,206
Ontario	2,964	2,840	3,095	1,991	2,687	2,924	2,674	2,880
Manitoba	1,379	1,331	1,317	1,444	1,500	1,715	1,847	1,874
Saskatchewan	2,293	2,520	3,336	3,792	4,522	4,988	4,838	5,107
Alberta	1,223	1,502	1,827	2,124	2,538	2,652	2,767	3,090
Other	326	341	380	374	383	354	380	384
Total Canada	9,840	10,061	11,556	10,996	13,313	14,790	14,952	15,850
Mexico	...	...	...	...	...	...	...	...
Total	47,197	48,503	52,552	52,523	56,866	59,139	56,787	59,173
SOUTH AMERICA.								
Argentina	1,999	3,087	2,869	2,565	2,525	3,200	3,080	2,361
Chile	68	122	152	161	126	79	79	...
Uruguay	46	97	82	105	142	165	85	85
Total	2,113	3,306	3,103	2,831	2,793	3,444	3,244	...
EUROPE.								
Austria	[2] 4,613	[3] 2,835	[3] 2,663	[4] 3,630	700	651	606	...
Hungary proper[2]	2,669	2,603	2,664	...	...	...	...	[5] 836
Croatia Slavonia[2]	246	...	...	...	...	...	...	...
Bosnia Herzegovina[2]	225	...	...	...	...	...	...	...
Belgium	644	686	...	...	...	...	550	537
Bulgaria[2]	455	379	395	326	343	345	[5] 302	[5] 319
Czecho-Slovakia	...	...	...	...	...	...	[6] 1,302	1,947
Denmark	1,028	...	1,024	1,042	981	937	961	1,001
Finland	[7] 987	...	...	...	...	...	1,013	1,013
France	[2] 9,801	[2] 8,873	8,062	7,777	7,308	6,721	[8] 7,055	[8] 8,065
Alsace Lorraine	284	278	275	...	...	...	...	...
Germany[2]	10,750	10,843	11,404	[8] 8,759	[8] 8,625	[8] 8,071	[8] 7,240	[8] 8,006
Greece	...	89	100	[9] 145	[10] 165	...	155	...
Italy	1,253	1,213	1,208	1,103	1,107	1,211	1,129	1,159
Jugo-Slavia	...	...	...	...	...	...	...	1,036
Luxemburg	77	77	72	69	56	48	...	...
Netherlands	346	346	358	343	371	392	368	392
Norway	266	270	306	307	356	343	343	343
Roumania[2]	1,105	1,056	1,065	1,068	...	[11] 1,084	[12] 952	[13] 2,053
Russia proper[2]	38,013	39,195	33,945	34,706	...	...	...	...
Poland[2]	2,858	...	985	...	...	...	[14] 2,886	[14] 3,791
Northern Caucasia[2]	1,190	1,099	...	...	...	...	...	...
Serbia[2]	266	...	...	...	...	...	...	...
Spain	1,276	1,304	1,403	1,398	1,425	1,507	1,595	1,574
Sweden	1,969	1,960	1,970	1,954	1,933	1,811	1,760	1,758
Switzerland	81	83	92	63	71	86	57	56
United Kingdom:								
England	1,835	1,730	1,888	1,862	2,013	2,415	2,252	2,015
Wales	204	200	199	222	246	366	312	249
Scotland	952	920	983	991	1,041	1,244	1,111	1,032
Ireland	1,049	1,028	1,089	1,072	1,464	1,580	1,442	1,331
Total	4,040	3,879	4,159	4,147	4,764	5,605	5,117	4,627
Total Europe	84,158	...	...	...	...	...	...	...

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Galicia and Bukowina not included.
[4] Includes Galicia, excludes Bukowina.
[5] New boundaries.
[6] Bohemia and Moravia.
[7] Census of 1910.
[8] Excludes Alsace-Lorraine.
[9] Excludes Macedonia.
[10] Excludes Eastern Macedonia.
[11] Includes Bessarabia but excludes Dobrudja.
[12] Former Kingdom, Bessarabia and Bukowina.
[13] Former Kingdom, Bessarabia, Bukowina and Transylvania.
[14] Unofficial.

OATS—Continued.

TABLE 36.—*Oats: Area and production in undermentioned countries, 1909–1920*—Contd.

AREA—Continued.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
ASIA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
Cyprus	....	....	....	....	....	....	....	....
Russia:								
Central Asia (4 governments)[2]	938	1,127	986	....	....	....	....	....
Siberia (4 governments)[2]	3,972	5,148	5,161	....	....	....	....	....
Transcaucasia (1 government)[2]	2	2	2	....	....	....	....	....
Total Russia	4,912	6,277	6,149	....	....	....	....	....
AFRICA.								
Algeria	456	573	590	536	682	588	533	576
Tunis	141	99	148	164	124	151	127	124
Union of South Africa	....	....	....	....	250	257	558	564
Total	....	....	....	....	1,056	996	1,218	1,264
AUSTRALASIA.								
Australia:								
Queensland	2	4	3	(3)	7	2	(3)	....
New South Wales	75	103	43	58	67	83	86	....
Victoria	388	442	435	354	442	293	343	....
South Australia	101	117	141	127	152	107	161	....
Western Australia	81	134	96	104	122	96	142	....
Tasmania	61	59	57	78	55	35	36	....
Total	708	859	775	721	845	616	768	....
New Zealand	376	362	288	213	177	156	173	410
Total Australasia	1,084	1,221	1,063	934	1,022	772	941	....
Grand total	140,061	....	....	....	....	....	....	....

PRODUCTION.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	1,131,175	1,141,060	1,549,030	1,251,837	1,592,740	1,538,124	1,231,754	1,526,055
Canada:								
New Brunswick	5,933	6,488	5,560	6,039	4,275	7,051	9,261	9,118
Quebec	40,294	42,119	42,182	24,411	32,466	52,667	57,275	66,729
Ontario	105,036	99,400	122,810	50,771	98,078	131,753	78,388	129,171
Manitoba	54,192	31,951	50,750	48,439	45,375	54,474	57,698	57,657
Saskatchewan	98,481	61,816	145,066	163,278	123,214	107,253	112,157	141,549
Alberta	52,045	57,076	83,876	102,199	86,289	60,323	65,725	115,091
Other	11,697	14,228	14,710	15,074	13,315	12,791	13,883	11,395
Total Canada	367,678	313,078	464,954	410,211	403,012	426,312	394,387	539,710
Mexico	17	17	17	17	....	....	....	....
Total	1,498,870	1,454,155	2,014,001	1,662,065	....	....	....	....
SOUTH AMERICA.								
Argentina	52,122	50,981	49,397	75,280	32,009	68,635	33,762	57,113
Chile	2,934	4,437	7,104	6,350	5,564	3,177	3,250	[4]2,479
Uruguay	830	1,850	933	2,283	1,926	3,697	1,288	1,728
Total	55,886	57,268	57,434	83,913	39,499	75,509	38,300	61,320

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Less than 500 acres.
[4] Unofficial.

OATS—Continued.

TABLE 36.—*Oats: Area and production in undermentioned countries, 1909–1920*—Contd.

PRODUCTION—Continued.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
EUROPE.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels*
Austria	[2] 143, 392	[3] 132, 114	[3] 57, 625	[4] 95, 593	10, 901	12, 933	13, 581	....
Hungary proper [2]	85, 840	86, 537	80, 925	....	....	....	....	[5] 23, 120
Croatia Slavonia [2]	5, 216	4, 000	5, 000	....	....	....	....	....
Bosnia Herzegovina [2]	4, 973	3, 000	4, 000	....	....	....	....	....
Belgium	40, 905	49, 742	40, 000	....	....	....	26, 920	27, 876
Bulgaria [2]	9, 880	8, 080	9, 545	7, 372	6, 558	3, 613	[5] 7, 387	[5] 9, 731
Czecho-Slovakia	....	....	....	....	....	....	[6] 43, 951	55, 859
Denmark	43, 115	38, 653	42, 859	51, 656	37, 653	41, 571	47, 585	47, 275
Finland	21, 989	19, 572	22, 905	22, 067	....	[7] 22, 649	24, 133	24, 562
France [2]	310, 020	274, 458	238, 551	277, 179	214, 259	176, 504	[8] 168, 303	[8] 290, 925
Alsace-Lorraine	13, 184	13, 172	6, 607	....	....	4, 049	8, 030	....
Germany [2]	591, 996	622, 674	412, 400	....	[8] 249, 964	[8] 322, 475	[8] 309, 587	[7 8] 237, 600
Greece	....	2, 296	2, 182	[9] 2, 742	[10] 2, 038	....	2, 749	3, 996
Italy	36, 945	26, 827	31, 443	26, 076	33, 889	45, 353	34, 695	24, 223
Jugo-Slavia	....	....	....	....	....	....	....	28, 598
Luxemburg	3, 382	3, 784	1, 881	2, 720	2, 015	1, 459	....	....
Netherlands	18, 512	19, 957	20, 692	22, 240	18, 594	18, 617	20, 512	24, 285
Norway	10, 245	9, 325	10, 318	13, 502	17, 004	16, 582	15, 106	15, 153
Roumania [2]	27, 545	25, 015	29, 054	28, 935	....	[11] 5, 890	[12] 22, 824	[13] 37, 206
Russia proper [2]	874, 945	692, 197	757, 308	843, 249	....	....	....	....
Poland	[2] 76, 590	....	....	....	....	....	[7] 91, 629	[7] 128, 142
Northern Caucasia [2]	29, 602	30, 291	25, 267	....	....	....	....	....
Serbia [2]	5, 443	5, 000	4, 000	....	....	....	....	....
Spain	29, 110	31, 227	36, 949	32, 163	33, 048	30, 474	32, 915	37, 772
Sweden	79, 115	52, 557	91, 311	93, 089	61, 400	57, 880	76, 591	66, 207
Switzerland	4, 784	5, 181	5, 601	4, 127	4, 209	5, 188	2, 811	3, 114
United Kingdom:								
England	74, 750	71, 408	78, 409	77, 676	80, 981	104, 480	82, 950	78, 768
Wales	7, 274	7, 431	7, 305	8, 237	8, 678	13, 847	11, 264	7, 312
Scotland	37, 670	38, 115	46, 313	37, 362	44, 949	53, 284	42, 440	41, 256
Ireland	63, 083	63, 287	58, 065	52, 774	80, 119	85, 822	85, 540	65, 388
Total United Kingdom	182, 777	180, 241	184, 092	176, 049	214, 727	257, 433	222, 194	192, 724
Total	2, 636, 321	....	....	....	....	....	....	....
ASIA.								
Cyprus	429	400	405	....	....	....	[7] 187	....
Russia:								
Central Asia (4 Governments)[2]	15, 044	27, 887	16, 422	....	....	....	....	....
Siberia (4 Governments)[2]	72, 305	133, 275	68, 381	....	....	....	....	....
Transcaucasia (1 government)[2]	54	31	36	....	....	....	....	....
Total Russia	87, 403	161, 193	84, 839	....	....	....	....	....
AFRICA.								
Algeria	12, 950	10, 000	15, 082	13, 140	16, 125	22, 914	13, 557	5, 890
Tunis	4, 333	689	3, 445	2, 067	3, 996	3, 817	3, 445	1, 516
Union of South Africa	7, 197	....	9, 661	....	6, 927	10, 775	9, 520	7, 519
Total	24, 480	....	28, 188	....	27, 048	37, 506	26, 522	14, 925

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] Includes Galicia, excludes Bukowina, Goritz and Gradisca.
[5] New boundaries.
[6] Bohemia and Moravia.
[7] Unofficial.
[8] Excludes Alsace-Lorraine.
[9] Excludes Macedonia.
[10] Excludes Eastern Macedonia.
[11] Includes Bessarabia, excludes Dobrudja.
[12] Former Kingdom, Bessarabia and Bukowina.
[13] Former Kingdom and Bessarabia.

OATS—Continued.

TABLE 36.—*Oats: Area and production in undermentioned countries, 1909-1920*—Contd.

PRODUCTION—Continued.

Country.	Average[1] 1909-1913.	1914	1915	1916	1917	1918	1919	1920
AUSTRALASIA.								
Australia:	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*	*1000 bushels.*
Queensland	47	58	44	2	109	45	4	....
New South Wales	1,571	1,893	512	1,344	1,083	1,455	1,273	....
Victoria	8,592	9,170	1,608	9,329	8,289	6,141	5,275	....
South Australia	1,371	1,239	368	2,134	1,840	1,249	1,541	....
Western Australia	1,204	1,708	465	1,538	1,689	909	1,500	....
Tasmania	2,066	1,644	1,342	2,189	1,006	589	848	....
Total	14,851	15,712	4,339	16,536	14,016	10,388	10,441	....
New Zealand	13,664	15,206	11,436	7,653	5,371	4,943	6,885	....
Total Australasia	28,515	30,918	15,775	24,189	19,387	15,331	17,326	....
Grand total	4,331,904	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.

TABLE 37.—*Oats: World production so far as reported, 1895–1916.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1895	3,008,154,000	1901	2,862,615,000	1907	3,603,896,000	1913	4,697,437,000
1896	2,847,115,000	1902	3,626,303,000	1908	3,591,012,000	1914	4,034,857,000
1897	2,633,971,000	1903	3,378,034,000	1909	4,312,882,000	1915	4,362,713,000
1898	2,903,974,000	1904	3,611,302,000	1910	4,182,410,000	1916	4,138,050,000
1899	3,256,256,000	1905	3,510,167,000	1911	3,808,561,000		
1900	3,166,002,000	1906	3,544,961,000	1912	4,617,394,000		

TABLE 38.—*Oats: Average yield per acre in undermentioned countries. 1890–1920.*

Year.	United States.[1]	Russia (European).[1]	Germany.[1]	Austria.[1]	Hungary proper.[1]	France.[2]	United Kingdom.[2]
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1890–1899	26.1	17.8	40.0	25.3	....	29.8	43.6
1900–1909	29.3	20.0	50.7	29.8	30.7	31.6	44.3
1910–1914	30.5	21.8	54.7	37.5	31.9	31.0	42.9
1906	31.2	15.1	55.7	34.1	34.2	27.0	43.8
1907	23.7	19.7	58.3	35.7	30.0	31.8	45.1
1908	25.0	20.1	50.2	32.0	26.8	29.6	43.5
1909	28.6	25.7	59.0	37.4	33.8	34.1	45.9
1910	31.6	22.5	51.3	31.5	26.8	29.8	44.3
1911	24.4	18.6	49.6	33.7	33.8	30.8	41.5
1912	37.4	23.6	54.1	36.2	31.1	31.9	41.7
1913	29.2	26.3	61.1	39.3	34.6	31.6	43.0
1914	29.7	17.9	57.4	46.6	33.2	31.0	44.0
1915	37.8	22.4	36.2	21.6	30.4	25.6	44.3
1916	30.1	24.3	[3] 54.4	26.2	....	30.2	42.5
1917	36.6	....	[3] 29.0	....	....	[1] 36.8	45.1
1918	34.7	....	[3] 39.9	....	....	26.5	44.5
1919	29.4	....	....	....	....	....	39.9
1920	35.2	....	....	....	....	....	....

[1] Bushels of 32 pounds. [2] Winchester bushels. [3] Excluding Alsace-Lorraine.

OATS—Continued.

TABLE 39.—*Oats: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value, Dec. 1.	Chicago cash price per bushel, contract.[1] December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, including oatmeal, fiscal year beginning July 1.[2]	Imports, during fiscal year beginning July 1.[3]
	Acres.	*Bush.*	*Bushels.*	*Cts.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*	*Bushels.*
1849	......	......	*146,584,000*	......	......	......	......	......	......	......	......
1859	......	......	*172,643,000*	......	......	......	......	......	......	......	......
1866	8,864,000	30.2	268,141,000	35.1	94,058,000	36	43	59	78	825,895	778,198
1867	10,082,000	27.6	278,698,000	44.5	123,903,000	52	57¼	......	......	122,554	780,798
1868	9,666,000	26.4	254,961,000	41.7	106,356,000	43	49½	56¾	62½	481,871	326,659
1869	9,461,000	30.5	288,334,000	38.0	109,522,000	40	44¾	46½	53½	121,517	2,266,785
1869	......	......	*282,107,000*	......	......	......	......	......	......	......	......
1870	8,792,000	28.1	247,277,000	39.0	96,444,000	37¾	41	47¼	51	147,572	599,514
1871	8,366,000	30.6	255,743,000	36.2	92,591,000	30¾	33	34¾	42½	262,975	535,250
1872	9,001,000	30.2	271,747,000	29.9	81,304,000	23½	25¾	30	34	714,072	225,555
1873	9,752,000	27.7	270,340,000	34.6	93,474,000	34	40⅝	44	48½	812,873	191,802
1874	10,897,000	22.1	240,369,000	47.1	113,134,000	51¾	54½	57¼	64½	504,770	1,500,040
1875	11,915,000	29.7	354,318,000	32.0	113,441,000	29½	30½	28⅝	31½	1,466,228	121,547
1876	13,359,000	24.0	320,884,000	32.4	103,845,000	31¾	34½	37¼	45¾	2,854,128	41,597
1877	12,826,000	31.7	406,394,000	28.4	115,546,000	24⅛	27	23	27	3,715,479	21,391
1878	13,176,000	31.4	413,579,000	24.6	101,752,000	19⅝	20⅜	24⅜	30½	5,452,136	13,395
1879	12,684,000	28.7	363,761,000	33.1	120,533,000	32¾	36¾	29½	34⅞	766,366	489,576
1879	*16,145,000*	*25.3*	*407,859,000*	......	......	......	......	......	......	......	......
1880	16,188,000	25.8	417,885,000	36.0	150,244,000	29⅛	33½	36¼	39½	402,904	64,412
1881	16,832,000	24.7	416,481,000	46.4	193,199,000	43½	46¾	48¾	56⅞	625,690	1,850,983
1882	18,495,000	26.4	488,251,000	37.5	182,978,000	34¾	41½	38¾	42¾	461,496	815,017
1883	20,325,000	28.1	571,302,000	32.7	187,040,000	29⅜	36⅛	30¾	34¼	3,274,622	121,069
1884	21,301,000	27.4	583,628,000	27.7	161,528,000	22½	25¼	34½	37	6,203,104	94,310
1885	22,784,000	27.6	629,409,000	28.5	179,632,000	27	29	26¼	29¾	7,311,306	149,480
1886	23,658,000	26.4	624,134,000	29.8	186,138,000	25¾	27¼	25⅛	27½	1,374,635	139,575
1887	25,921,000	25.4	659,618,000	30.4	200,700,000	28⅝	30⅞	32½	38	573,080	123,817
1888	26,998,000	26.0	701,735,000	27.8	195,424,000	25	26⅞	21⅝	23⅝	1,191,471	131,501
1889	27,462,000	27.4	751,515,000	22.9	171,781,000	20	21	24¾	30	15,107,238	153,232
1889	*28,321,000*	*28.6*	*809,251,000*	......	......	......	......	......	......	......	......
1890	26,431,000	19.8	523,621,000	42.4	222,048,000	39⅞	43⅞	45¼	54	1,382,836	41,848
1891	25,582,000	28.9	738,394,000	31.5	232,312,000	31⅛	33⅝	28⅛	33½	10,586,644	47,782
1892	27,064,000	24.4	661,035,000	31.7	209,254,000	25⅝	31¼	28¾	32¼	2,700,793	49,433
1893	27,273,000	23.4	638,855,000	29.4	187,576,000	27½	29⅛	32½	36	6,290,229	31,759
1894	27,024,000	24.5	662,037,000	32.4	214,817,000	28¾	29⅝	27½	30⅞	1,708,824	330,318
1895	27,878,000	29.6	824,444,000	19.9	163,655,000	16⅝	17½	18	19⅜	15,156,618	66,602
1896	27,566,000	25.7	707,346,000	18.7	132,485,000	16½	18⅞	16⅞	18¾	37,725,083	131,204
1897	25,730,000	27.2	698,768,000	21.2	147,975,000	21	23⅞	26	32	73,880,307	25,093
1898	25,777,000	28.4	730,907,000	25.5	186,405,000	26	27¾	24	27¾	33,534,362	28,098
1899	26,341,000	30.2	796,178,000	24.9	198,168,000	24¼	23	21¼	23¾	45,048,857	54,576
1899	*29,540,000*	*31.9*	*943,389,000*	......	......	......	......	......	......	......	......
1900	27,365,000	29.6	809,126,000	25.8	208,669,000	21¾	22¾	27⅞	31	42,268,931	32,107
1901	28,541,000	25.8	736,809,000	39.9	293,659,000	42	48¼	41	49½	13,277,612	38,978
1902	28,653,000	34.5	987,843,000	30.7	303,585,000	29¼	32	33⅞	38¼	8,381,805	150,065
1903	27,638,000	28.4	784,094,000	34.1	267,662,000	34¼	38	39⅝	44¾	1,960,740	183,983
1904	27,843,000	32.1	894,596,000	31.3	279,900,000	28¼	32	28⅞	32	8,394,692	55,699
1905	28,047,000	34.0	953,216,000	29.1	277,048,000	29½	32⅞	32⅛	34¾	48,434,541	40,025
1906	30,959,000	31.2	964,905,000	31.7	306,293,000	33	35⅞	44½	48½	6,386,334	91,289
1907	31,837,000	23.7	754,443,000	44.3	334,568,000	46½	50⅞	52¾	56½	2,518,855	383,418
1908	32,344,000	25.0	807,156,000	47.2	381,171,000	48⅝	50½	56¼	62½	2,333,817	6,691,700
1909	33,204,000	30.3	1,007,353,000	......	......	......	......	......	......	......	......
1909	*35,159,000*	28.6	*1,007,143,000*	40.2	405,121,000	40	45	36½	43¼	2,548,726	1,034,511
1910[4]	37,548,000	31.6	1,186,341,000	34.4	408,388,000	31	32½	31⅞	36	3,845,850	107,318
1911	37,763,000	24.4	922,298,000	45.0	414,663,000	46¼	47¼	50⅛	58	2,677,749	2,622,357
1912	37,917,000	37.4	1,418,337,000	31.9	452,469,000	31	31¾	35¼	43	36,455,474	723,899
1913	38,399,000	29.2	1,121,768,000	39.2	439,596,000	37⅜	40⅛	37	42½	2,748,743	22,273,624
1914	38,442,000	29.7	1,141,060,000	43.8	499,431,000	46⅞	49⅞	50½	56	100,609,272	630,722
1915	40,996,000	37.8	1,549,030,000	36.1	559,506,000	40⅞	44	39½	49½	98,960,481	665,314
1916	41,527,000	30.1	1,251,837,000	52.4	655,928,000	46¾	54	59½	74	95,105,698	761,644
1917	43,553,000	36.6	1,592,740,000	66.6	1,061,474,000	70¼	80⅛	72	79½	125,090,611	2,591,077
1918	44,349,000	34.7	1,538,124,000	70.9	1,090,322,000	68	71½	67⅞	74¼	109,004,734	551,355
1919	41,835,000	29.4	1,231,754,000	71.5	880,296,000	77	89	100½	117¼	43,436,744	6,043,835
1920	43,323,000	35.2	1,526,055,000	47.2	719,782,000	47	52	......	......	......	......

[1] Quotations are for No. 2 to 1906.
[2] Oatmeal not included 1866 to 1882, inclusive.
[3] Oatmeal not included 1867 to 1882, inclusive, and 1909.
[4] Figures adjusted to census basis.

OATS—Continued.

TABLE 40.—*Oats: Revised acreage, production, and farm value, 1879 and 1889–1909.*

[See head note of Table 5.]

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1879	*16,145,000*	27.9	450,745,000	33.3	150,178,000
1889	*28,321,000*	28.3	801,586,000	21.9	175,801,000
1890	28,102,000	20.4	572,665,000	41.6	238,345,000
1891	27,604,000	30.4	838,876,000	30.6	256,814,000
1892	28,023,000	24.8	695,267,000	31.5	218,954,000
1893	28,452,000	23.8	676,154,000	29.1	196,505,000
1894	28,362,000	25.2	715,559,000	32.1	229,538,000
1895	29,379,000	30.2	885,900,000	19.4	172,186,000
1896	29,645,000	26.3	780,563,000	18.3	143,192,000
1897	28,353,000	27.9	791,591,000	20.8	164,886,000
1898	28,769,000	29.3	842,747,000	25.2	212,482,000
1899	*29,540,000*	31.3	925,555,000	24.5	226,588,000
1900	30,290,000	29.9	904,566,000	25.4	230,160,000
1901	29,894,000	26.0	778,531,000	40.0	311,374,000
1902	30,578,000	34.5	1,055,441,000	30.6	322,944,000
1903	30,866,000	27.5	848,824,000	33.8	286,879,000
1904	31,353,000	32.1	1,007,183,000	31.0	312,467,000
1905	32,072,000	33.3	1,068,780,000	28.8	308,086,000
1906	33,353,000	31.0	1,034,623,000	31.8	329,142,000
1907	33,641,000	24.0	807,308,000	44.3	357,340,000
1908	34,006,000	24.9	847,109,000	47.3	400,363,000
1909	*35,159,000*	30.4	1,068,289,000	40.6	433,869,000

TABLE 41.—*Oats: Acreage, production, and total farm value, by States, 1919 and 1920.*

State.	Thousands of acres.		Production (thousands of bushels).		Total value, basis Dec. 1 price (thousands of dollars).	
	1920	1919	1920	1919	1920	1919
Maine	119	115	4,974	3,910	4,228	3,597
New Hampshire	14	15	546	510	410	434
Vermont	81	85	2,835	2,550	2,126	2,295
Massachusetts	14	16	518	608	414	547
Rhode Island	1	1	28	30	22	28
Connecticut	24	25	744	775	558	682
New York	1,150	1,120	44,275	28,560	29,664	23,705
New Jersey	85	88	2,720	2,640	2,040	2,112
Pennsylvania	1,175	1,189	45,825	36,859	30,244	29,487
Delaware	6	6	198	138	139	124
Maryland	65	65	2,112	1,820	1,478	1,492
Virginia	220	240	4,818	5,280	3,903	5,280
West Virginia	200	190	5,400	4,750	4,266	4,322
North Carolina	180	198	3,960	3,307	3,802	3,505
South Carolina	434	510	10,416	11,730	10,728	12,903
Georgia	550	500	11,550	10,000	12,474	11,500
Florida	60	54	1,020	1,026	612	1,231
Ohio	1,614	1,523	71,339	51,020	35,670	36,734
Indiana	1,875	1,750	76,875	56,000	35,362	38,640
Illinois	4,100	4,180	161,950	125,400	69,638	87,780
Michigan	1,425	1,425	56,430	35,625	27,086	25,294
Wisconsin	2,408	2,348	107,878	78,423	52,860	54,896
Minnesota	3,373	3,275	126,488	91,700	45,536	58,688
Iowa	5,894	5,670	229,866	196,182	82,752	125,556
Missouri	1,775	1,675	54,138	45,225	26,528	32,110
North Dakota	2,485	2,280	59,640	35,340	20,874	23,678
South Dakota	2,219	1,850	75,446	53,650	24,897	33,800
Nebraska	2,400	2,133	83,040	69,962	30,725	45,475
Kansas	2,241	1,574	68,799	44,229	26,832	32,287
Kentucky	350	350	8,225	7,875	6,004	7,166

OATS—Continued.

TABLE 41.—*Oats: Acreage, production, and total farm value, by States, 1919 and 1920*—Continued.

State.	Thousands of acres.		Production (thousands of bushels).		Total value, basis Dec. 1 price (thousands of dollars).	
	1920	1919	1920	1919	1920	1919
Tennessee	350	300	8,225	6,600	6,416	6,138
Alabama	366	372	6,551	6,696	5,765	7,031
Mississippi	236	278	4,012	4,448	3,490	4,670
Louisiana	60	75	1,380	1,650	1,132	1,650
Texas	1,575	2,250	44,100	94,500	29,106	60,480
Oklahoma	1,500	1,425	48,000	47,025	21,120	32,918
Arkansas	352	320	8,800	7,040	6,864	6,195
Montana	600	650	16,800	6,110	8,568	5,560
Wyoming	300	285	11,400	5,130	7,068	5,746
Colorado	255	249	8,058	6,524	4,835	5,872
New Mexico	67	61	2,278	2,196	1,822	2,086
Arizona	13	13	481	494	462	494
Utah	78	72	3,143	2,448	2,514	2,399
Nevada	6	8	252	256	302	256
Idaho	200	210	8,000	7,350	5,440	7,203
Washington	323	324	15,052	12,960	10,837	12,053
Oregon	330	318	12,045	9,953	7,829	9,157
California	175	175	5,425	5,250	4,340	5,040
United States	43,323	41,835	1,526,055	1,231,754	719,782	880,296

TABLE 42.—*Oats: Production and distribution in the United States, 1897–1920.*

[000 omitted, except in weight and quality columns.]

Year.	Old stock on farms Aug. 1.	Crop.			Total supplies.	Stock on farms Mar. 1 following.	Shipped out of county where grown.
		Quantity.	Weight per bushel.	Quality.			
	Bushels.	*Bushels.*	*Pounds.*	*Per cent.*	*Bushels.*	*Bushels.*	*Bushels.*
1897	71,139	698,768	28.6	87.6	769,907	271,729	204,147
1898	44,554	730,907	30.5	84.5	775,461	283,209	193,527
1899	50,537	796,178	29.7	89.5	846,715	290,937	223,014
1900	54,214	809,126	31.3	89.2	863,340	292,803	242,850
1901	47,713	736,809	31.1	83.7	784,522	226,393	143,398
1902	30,570	987,843	30.7	86.7	1,018,413	364,926	258,438
1903	73,352	784,094	31.0	79.9	857,446	273,708	223,959
1904	42,194	894,596	29.7	91.4	936,790	347,166	261,989
1905	55,836	953,216	31.5	92.4	1,009,052	379,805	277,133
1906	67,688	964,905	32.0	88.2	1,032,593	384,461	298,182
1907	68,258	754,443	29.4	77.0	822,701	267,476	210,923
1908	37,797	807,156	29.8	81.3	844,953	278,847	244,411
1909	26,323	1,007,143	32.7	91.4	1,033,466	365,438	320,255
1910	64,200	1,186,341	32.7	93.8	1,250,541	412,665	363,103
1911	67,801	922,298	31.1	84.6	990,099	289,989	265,944
1912	34,875	1,418,337	33.0	91.0	1,453,212	604,249	438,130
1913	103,916	1,121,768	32.1	89.1	1,225,684	419,481	297,365
1914	62,467	1,141,060	31.5	86.5	1,203,527	379,369	335,539
1915	55,607	1,549,030	33.0	87.5	1,604,637	598,148	465,823
1916	113,728	1,251,837	31.2	88.2	1,365,565	394,211	355,092
1917	47,834	1,592,740	33.4	95.1	1,640,574	599,208	514,117
1918	81,424	1,538,124	33.2	93.6	1,619,518	590,251	421,568
1919	93,045	1,231,754	31.1	84.7	1,324,799	418,983	320,318
1920	56,128	1,526,055	33.1	93.3	1,582,183	....	....

OATS—Continued.

Table 43.—*Oats: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911–1920.	1916	1917	1918	1919	1920	5-year average, 1915–1919.	1920
Me.	37.5	38.5	34.6	40.0	41.0	40.0	36.0	29.0	40.0	34.0	41.8	68	67	85	90	92	85	26.81	35.53
N. H	37.0	33.8	39.0	35.0	38.0	38.0	37.0	38.0	38.0	34.0	39.0	68	69	84	87	85	75	27.99	29.25
Vt	37.6	35.0	43.0	39.0	42.5	43.0	32.0	36.0	41.0	30.0	35.0	67	65	85	90	90	75	27.62	26.25
Mass	35.8	35.0	34.0	35.0	37.0	36.0	32.0	37.0	40.0	38.0	34.0	67	66	81	91	90	80	28.01	29.60
R. I	30.2	29.0	28.6	26.0	27.5	33.0	27.0	31.0	42.0	30.0	28.0	67	68	75	90	95	80	24.88	22.40
Conn	31.8	35.1	30.7	28.0	29.0	32.5	30.0	33.0	38.0	31.0	31.0	67	69	79	90	88	75	25.23	23.25
N. Y	33.2	29.5	30.8	33.5	31.5	40.5	26.0	35.0	41.0	25.5	38.5	61	62	75	84	83	67	23.24	25.80
N. J	31.3	28.5	27.6	29.0	29.0	32.5	30.0	34.0	40.0	30.0	32.0	61	61	70	79	80	75	22.66	24.00
Pa	33.5	28.3	33.1	31.0	30.0	38.0	31.0	35.0	39.0	31.0	39.0	59	57	73	80	80	66	23.19	25.74
Del	30.4	30.0	30.5	30.5	27.0	33.5	30.0	32.0	35.0	23.0	33.0	63	62	78	87	90	70	22.36	23.10
Md	30.0	27.0	30.0	28.0	27.0	34.0	29.5	31.0	33.0	28.0	32.5	62	61	75	86	82	70	21.85	22.75
Va	21.9	20.0	22.2	21.5	15.5	25.0	23.5	24.5	23.0	22.0	21.9	70	63	84	100	100	81	18.83	17.74
W. Va	25.2	22.0	28.0	24.0	20.0	29.0	23.0	27.0	27.0	25.0	27.0	66	64	79	91	91	79	19.63	21.33
N. C	18.4	16.5	18.6	19.5	17.5	23.0	17.5	16.0	17.0	16.7	22.0	79	74	93	108	106	96	15.63	21.12
S. C	20.6	20.4	21.5	23.5	20.0	19.0	18.0	15.0	22.0	23.0	24.0	86	80	100	118	110	103	18.68	24.72
Ga	20.0	21.5	20.8	22.0	20.0	19.5	19.5	16.0	20.0	20.0	21.0	88	79	117	119	115	108	18.76	22.68
Fla	17.0	13.5	17.2	18.0	18.0	20.0	15.0	14.0	18.0	19.0	17.0	82	71	98	115	120	60	16.37	10.20
Ohio	37.2	32.1	44.0	30.2	30.5	41.0	28.0	44.0	44.0	33.5	44.2	51	53	64	70	72	50	22.54	22.10
Ind	34.6	28.7	40.1	21.4	28.5	40.0	30.0	42.0	42.0	32.0	41.0	48	51	63	67	69	46	21.12	18.86
Ill	37.4	28.8	43.3	23.8	29.3	45.0	38.5	52.0	44.0	30.0	39.5	48	51	65	67	70	43	23.93	16.98
Mich	34.0	28.6	34.9	30.0	33.5	42.0	30.0	36.0	40.0	25.0	39.6	50	53	64	69	71	48	19.80	19.01
Wis	38.3	29.8	37.3	36.5	27.0	46.5	37.0	44.0	46.6	33.4	44.8	50	51	66	67	70	49	23.85	21.95
Minn	34.3	22.8	41.7	37.8	28.0	43.0	26.5	37.0	41.0	28.0	37.5	44	47	63	63	64	36	18.66	13.50
Iowa	37.7	25.5	44.2	34.5	33.0	40.0	37.0	47.0	42.0	34.6	39.0	45	48	63	64	64	36	21.84	14.04
Mo	26.8	14.8	33.0	21.2	21.5	26.0	25.0	40.0	29.0	27.0	30.5	51	53	61	70	71	49	17.40	14.94
N. Dak	25.8	23.5	41.4	25.7	28.0	40.0	21.5	15.0	23.5	15.5	24.0	43	44	62	61	67	35	10.86	8.40
S. Dak	30.4	7.4	33.8	26.5	27.5	42.0	30.5	34.0	39.0	29.0	34.0	43	46	61	59	63	33	17.56	11.22
Nebr	29.2	13.9	24.4	26.5	32.0	32.0	35.5	38.0	22.2	32.8	34.6	46	47	61	65	65	37	17.11	12.80
Kans	26.2	15.0	32.0	19.5	33.5	26.5	23.5	31.0	22.0	28.1	30.7	51	55	64	73	73	39	15.83	11.97
Ky	22.9	18.4	26.9	19.8	21.0	26.0	21.0	26.0	24.0	22.5	23.5	64	60	76	90	91	73	17.38	17.16
Tenn	22.6	19.5	21.7	21.0	23.0	24.5	21.0	25.0	25.0	22.0	23.5	66	62	83	93	93	78	17.95	18.33
Ala	19.1	19.2	20.0	20.5	22.0	19.0	17.5	18.0	19.0	18.0	17.9	81	75	102	107	105	88	16.54	15.75
Miss	19.0	18.4	17.4	20.0	23.0	21.5	18.0	19.0	20.0	16.0	17.0	78	74	94	107	105	87	16.46	14.79
La	22.3	21.0	20.8	22.0	23.0	25.0	19.0	22.3	25.0	22.0	23.0	73	68	94	99	100	82	18.88	18.86
Tex	29.3	25.1	36.0	32.5	25.0	35.5	28.5	26.0	14.7	42.0	28.0	60	61	82	92	64	66	18.80	18.48
Okla	23.1	9.0	25.1	18.0	27.5	27.0	12.5	23.0	24.0	33.0	32.0	53	57	75	84	70	44	15.42	14.08
Ark	23.9	20.0	19.9	26.5	24.0	27.0	21.0	28.0	25.5	22.0	25.0	66	68	75	88	88	78	18.22	19.50
Mont	35.4	49.8	48.0	43.5	35.0	52.0	38.0	20.0	30.0	9.4	28.0	53	47	81	80	91	51	16.65	14.28
Wyo	35.9	34.5	41.8	38.0	35.0	42.0	35.0	36.0	41.0	18.0	38.0	61	60	80	80	112	62	24.16	23.56
Colo	35.1	35.0	42.8	35.0	40.0	39.0	33.0	38.0	30.0	26.2	31.6	58	60	76	80	90	60	22.45	18.96
N. Mex	33.4	38.8	34.7	30.0	38.0	36.0	29.0	30.0	28.0	36.0	34.0	67	67	84	89	95	80	24.35	27.20
Ariz	40.1	42.0	44.7	43.0	42.0	37.0	37.5	40.0	40.0	38.0	37.0	81	80	96	120	100	96	35.62	35.52
Utah	44.1	44.7	46.4	46.0	50.0	47.0	43.5	44.0	45.0	34.0	40.3	64	61	85	97	98	80	32.41	32.24
Nev	42.0	45.0	40.0	43.0	52.0	45.0	43.0	40.0	38.0	32.0	42.0	80	75	96	118	100	120	34.45	50.40
Idaho	42.6	44.0	48.9	46.5	44.0	47.0	43.0	38.0	40.0	35.0	40.0	57	54	77	94	98	68	28.07	27.20
Wash	44.8	51.7	48.2	47.5	47.0	50.0	52.0	38.5	27.0	40.0	46.6	60	51	81	98	93	72	27.97	33.55
Oreg	36.0	34.7	38.2	42.3	35.0	44.0	48.0	25.0	25.0	31.3	36.5	58	49	75	96	92	65	22.27	23.72
Calif	33.3	34.0	39.0	31.6	35.0	33.0	32.5	35.0	32.0	30.0	31.0	70	72	85	94	96	80	25.71	24.80
U. S	32.4	24.4	37.4	29.2	29.7	37.8	30.1	36.6	34.7	29.4	35.2	50.5	52.4	66.6	70.9	71.5	47.2	19.89	16.61

[1] Based upon farm price Dec. 1.

OATS—Continued.

TABLE 44.—*Oats: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	78.2	70.8	73.9	51.4	39.1	45.0	39.1	32.2	45.1	33.2	50.8
Feb. 1	82.7	64.3	78.7	55.2	44.6	50.1	39.3	32.4	47.5	33.1	52.8
Mar. 1	84.5	62.6	86.2	56.9	42.7	52.1	38.9	33.1	49.8	32.8	54.0
Apr. 1	90.7	65.8	88.9	61.5	42.0	53.4	39.5	33.1	52.0	32.3	55.9
May 1	98.3	70.9	86.0	71.0	42.6	53.4	39.5	34.2	56.0	33.2	58.5
June 1	102.9	71.2	78.1	69.9	42.1	51.3	40.0	36.0	55.3	34.7	58.2
July 1	104.5	70.9	76.3	68.9	40.4	46.7	38.8	37.7	52.5	37.5	57.4
Aug. 1	81.9	75.3	73.0	73.7	40.1	45.4	36.7	37.6	44.3	40.2	54.8
Sept. 1	70.2	71.7	70.3	61.7	43.1	38.5	42.3	39.3	35.0	40.4	51.2
Oct. 1	60.7	68.4	71.0	62.3	44.5	34.5	43.3	39.6	33.6	42.5	50.0
Nov. 1	54.5	68.7	68.2	61.7	49.0	34.9	42.9	37.9	33.6	43.8	49.5
Dec. 1	47.2	71.5	70.9	66.6	52.4	36.1	43.8	39.2	31.9	45.0	50.5
Average	74.1	69.5	74.6	62.7	44.0	42.5	40.9	36.8	41.4	38.7	52.5

TABLE 45.—*Oats: Condition of crop, United States, on first of months named, 1900–1920.*

Year.	June.	July.	August.	When harvested.	Year.	June.	July.	August.	When harvested.	Year.	June.	July.	August.	When harvested.
1900	91.7	85.5	85.0	82.9	1907	81.6	81.0	75.6	65.5	1914	89.5	84.7	79.4	75.8
1901	85.3	83.7	73.6	72.1	1908	92.9	85.7	76.8	69.7	1915	92.2	93.9	91.6	91.1
1902	90.6	92.1	89.4	87.2	1909	88.7	88.3	85.5	83.8	1916	86.9	86.3	81.5	78.0
1903	85.5	84.3	79.5	75.7	1910	91.0	82.2	81.5	83.3	1917	88.8	89.4	87.2	90.4
1904	89.2	89.8	86.6	85.6	1911	85.7	68.8	65.7	64.5	1918	93.2	85.5	82.8	84.4
1905	92.9	92.1	90.8	90.3	1912	91.1	89.2	90.3	92.3	1919	93.2	87.0	76.5	73.1
1906	85.9	84.0	82.8	81.9	1913	87.0	76.3	73.8	74.0	1920	87.8	84.7	87.2	88.3

TABLE 46.—*Oats: Monthly marketings by farmers, 1914–1920.*

Month.	Estimated amount sold monthly by farmers of United States (millions of bushels).						Per cent of year's sales.					
	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15
July	47	34	24	31	23	35	14.4	8.0	4.7	8.3	5.1	10.4
August	60	82	82	87	53	64	18.4	19.6	16.1	23.3	11.8	18.7
September	33	50	67	51	59	55	10.1	11.9	13.5	13.5	13.0	16.3
October	30	42	56	40	57	40	9.2	9.9	11.1	10.7	12.7	11.7
November	19	30	38	30	48	27	5.8	7.2	7.7	8.0	10.6	7.9
December	27	28	39	21	47	23	8.3	6.7	7.8	5.7	10.5	6.9
January	26	28	42	28	33	26	8.2	6.7	8.3	7.5	7.4	5.6
February	21	19	40	20	36	19	6.6	4.5	8.0	5.3	8.0	7.6
March	16	23	35	20	23	15	4.9	5.5	7.1	5.2	5.0	4.4
April	11	27	33	14	21	13	4.3	6.3	6.5	3.8	4.6	3.7
May	17	29	20	17	28	10	5.2	7.0	4.0	4.4	6.3	3.1
June	15	28	24	16	22	13	4.6	6.7	4.9	4.5	5.0	3.7
Season	325	420	500	375	450	340	100.0	100.0	100.0	100.0	100.0	100.0

OATS—Continued.

TABLE 47.—*Oats: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost and freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	11.5	5.7	0.4	0.4	0.7	2.8	0.4	22.3	4.9	2.2	(1)	0.1	29.9
1918	12.9	.5	.2	1.3	.9	1.8	.3	18.1	1.1	.9	(1)	.2	20.7
1917	11.8	1.2	.2	2.7	.8	1.0	.3	18.2	.8	.4	(1)	(1)	19.8
1916	10.1	4.0	.4	.6	.8	2.8	.5	19.7	5.1	1.3	(1)	.1	27.2
1915	1.4	8.5	.9	.4	1.0	.1	.8	13.2	2.1	.3	(1)	.2	16.3
1914	1 .7	2.2	.2	.3	.8	2.6	.4	22.7	2.0	1.7	.1	.1	27.6
1913	22.7	.7	.2	.2	.6	1.8	.2	27.2	.5	1.1	.1	.1	30.3
1912	7.2	3.1	.3	.5	1.0	1.1	.5	14.1	1.6	.7	.1	.2	17.7
1911	27.6	1.0	(1)	.5	.3	5.1	.1	35.4	.7	1.5	.1	.2	39.5
1910	17.0	.8	.2	.7	.4	1.7	.3	21.4	.9	.6	.2	.2	24.0
1909	7.9	5.2	.6	.8	1.1	.9	.8	17.7	2.4	.5	.1	.4	22.2
Average	13.4	2.7	.3	.8	.8	1.9	.4	20.8	1.7	.9	.1	.2	24.5

[1] Less than .05 per cent.

OATS—Continued.

TABLE 48.—*Oats: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York, No. 2, white.[1]			Baltimore, No 3, white.			Cincinnati, No. 2, mixed.			Chicago, contract.[2]			Milwaukee, No. 3, white.			Duluth, No. 3, white.			Detroit, Standard.[3]			San Francisco, white (per 100 pounds).[4]		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Dolls.	Dolls.	Dolls.
1913.																								
January-June	36½	47	40.4	38½	47	41.6	33½	43½	36.4	31⅝	43⅛	35.4	31¼	42½	35.4	27⅛	41⅜	33.0	34½	44½	......	1.43½	1.67½	1.550
July-December	42½	48½	45.4	45	47½	46.2	39	47	42.3	36⅜	43⅜	39.7	37½	44	40.6	33⅞	42⅛	37.8	41	45½	......	1.37½	1.57½	1.480
1914.																								
January-June	43½	48½	45.9	42½	46¾	45.6	39¼	44	41.6	36⅝	42½	38.9	36½	43	39.4	33⅝	40	37.0	39½	45	41.6	1.22½	1.46¼	1.313
July-December	43½	58½	51.3	41½	55	49.7	35	51	45.7	33½	51⅛	45.0	34¼	52	45.2	33⅛	50⅝	43.7	37¾	53	47.4	1.20	1.60	1.432
1915.																								
January-June	53¾	66½	61.2	50	64	59.0	46	61½	55.8	46⅜	60⅝	51.2	47¼	61½	54.8	44⅛	58⅞	52.9	50	62	57.0	1.40	1.85	1.725
July-December	55	70½	64.2	38	66	47.1	33	58	42.0	35½	60	43.9	33¼	63	42.4	31⅝	58	39.2	36½	65	45.8	1.30	1.50	1.393
1916.																								
January-June	44½	57½	54.1	43	55¼	48.4	38	55½	45.0	37⅜	51	45.0	38¼	55	44.7	36⅛	49½	42.1	41	55½	47.4	1.32½	1.57½	1.465
July-December	44½	64	60.3	43¾	61½	53.0	39	91	51.4	38⅝	57	47.3	38½	58½	48.1	36⅝	57⅛	45.9	42½	60½	51.3	1.50	2.07½	1.771
1917.																								
January-June	61	79½	73.5	61	80	71.4	53½	74½	65.1	51¾	74	61.7	51½	77	64.0	49¾	76½	60.6	57	79	67.8	1.95	2.95	2.330
July-December	64½	93½	76.6	62	100	75.9	56	86½	68.2	51	85	66.2	52	89½	67.9	51¼	89	65.1	55⅝	89½	71.1	2.25	3.00	2.720
1918.																								
January-June	79	109	96.3	76½	107½	94.0	68	99	84.3	71	93	82.5	71½	96	85.0	69	96⅞	83.2	75	101	87.7	......	......	......
July-December	78½	90½	83.0	70	88	80.3	64	77	72.1	66⅜	78¾	71.9	65½	80	72.3	61⅝	79½	69.2	68	83½	74.4	......	......	......
1919.																								
January-June	62	83½	76.3	63	80½	73.8	56	74	68.1	54	76½	67.0	51	74½	66.3	49	70⅞	62.9	58	75½	69.0	1.95	2.60	2.150
July-December	77	98½	85.3	73½	92½	82.5	70½	86½	75.7	65¼	89	76.0	68	88½	74.6	61⅜	86⅜	71.4	71	89½	78.7	2.51	3.10	2.882
1920.																								
January	98	101	99.5	65	91½	92.0	87½	92½	89.2	84¼	91½	87.7	86	92½	89.0	79¼	86¼	81.9	88½	90½	89.7	2.95	3.35	3.060
February	101	103½	102.3	93	99½	97.9	85	94	90.1	80	92	87.2	81½	92	88.1	74¼	86¼	81.9	89	95	92.5	3.15	3.35	3.255
March	103	108½	105.3	99½	104½	102.9	92½	101	96.5	88	100	93.9	90½	100	95.1	82½	95⅜	88.5	91	99½	97.7	3.05	3.25	3.188
April	108	140	126.1	104½	127	119.3	106½	110½	106.2	97½	111½	103.8	100½	110½	105.0	90¾	102⅜	97.1	101	117	110.5	2.85	3.25	3.038
May	140	148	145.2	118	131	125.9	109	123	117.5	100½	117¼	112.2	102	116½	111.0	96	108⅝	103.4	120	130	124.4	3.15	3.50	3.344
June	130	143	134.5	120	135	126.2	111	121	116.0	107	129	116.8	107	120	115.8	99¾	116⅛	107.8	122	135	126.4	3.00	3.50	3.297
January-June	98	148	118.8	65	135	110.7	85	123	102.6	80	129	100.3	81½	120	100.7	74¼	116⅛	93.4	88½	135	106.9	2.85	3.50	3.197
July	98	132	119.0	117	128	124.6	85	114	100.0	72	116	97.5	77	115	98.0	81	113½	97.4	85	119	104.3	2.60	3.15	2.880
August	84	100	94.5	78	96	85.2	67	73	70.2	68	88½	74.6	69	85½	74.4	61½	74½	67.7	71½	106	90.8	2.30	3.00	2.524
September	67	82	75.1	62	78	70.3	56	65	62.4	55¾	70½	62.6	54¾	70	62.0	52⅞	64¾	58.4	60	70	64.4	2.25	2.70	2.463
October	65½	68	66.6	60	64	62.1	52	57½	55.1	52¼	57	55.2	51½	57	54.6	48⅞	53¼	51.2	60	70	64.4	2.25	2.65	2.464
November	60½	68	63.9	57½	65	61.7	47	57	53.0	46¾	56¾	51.8	45½	55	50.1	39¾	51¼	45.5	57½	62	59.5	2.15	2.65	2.409
December	60	65	62.5	57	61	58.9	47½	53	49.8	47	52	49.2	45	52	48.4	42	48½	45.1	48½	58½	51.1	1.45	2.25	1.847
July-December	60	132	80.3	57	128	77.1	47	114	65.1	46¾	116	65.2	45	115	64.6	39¾	113½	60.9	48½	119	72.9	1.45	3.15	2.431

[1] No. 3, white, 1916–1918. [2] Standard, January-June, 1919, and No. 2, white, July-December, 1920, inclusive. [3] Nos. 1 and 2, white, June, 1919. [4] Red feed, 1919 and 1920.

OATS—Continued.

TABLE 49.—*Oats (including oatmeal): International trade, calendar years, 1911–1919.*[1]

[See "General note," Table 15.]

EXPORTS.

Country.	Average 1911-1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Algeria	1,296	4,554	4,122	7,740	2,153	6,900	5,426
Argentina	52,754	24,368	40,840	55,421	18,719	37,347	22,958
Bulgaria	278	....	....	....	....	....	....
Canada	16,583	20,174	18,496	72,058	59,791	24,024	16,346
Chile	2,499	3,372	7,312	4,413	3,460	496	....
China	412	324	324	70	229	70	....
Denmark	151	168	2	4	2	1	....
Finland	433	350	237	9	....	....	....
Germany	30,844	....	....	....	....	....	....
Netherlands	33,814	14,441	34	18	(2)	(2)	127
Roumania	10,012	7,030	....	....	....	....	....
Russia	65,279	19,235	364	27	....	....	....
Sweden	2,342	2,316	(2)	478	(2)	(2)	36
United Kingdom	1,411	1,321	717	1,271	147	107	....
United States	12,592	36,656	108,195	105,838	113,614	131,085	67,570
Other countries	3,727	3,866	4,436	4,148	6,534	8,633	....
Total	234,427	138,169	185,079	251,495	204,619	208,663	....

IMPORTS.

Country.	Average 1911-1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	3,426	....	....	....	....	....	....
Belgium	8,845	....	....	....	....	....	3,948
Cuba	1,361	1,534	1,004	1,149	1,491	1,649	....
Denmark	4,126	3,740	217	8	67	(2)	....
Finland	1,187	1,037	148	18	....	....	....
France	30,746	35,473	56,610	72,324	42,819	33,353	31,632
Germany	41,320	....	....	....	....	....	....
Italy	9,040	4,549	27,647	38,308	19,802	19,258	12,046
Netherlands	41,901	20,006	4,332	4,902	2,712	1	2,870
Norway	698	517	594	18	25	11	....
Philippine Islands	486	74	441	165	200	53	....
Russia	1,643	1,899	599	4	....	....	....
Sweden	6,055	4,922	2,086	12	8	365	1,571
Switzerland	12,484	10,235	6,913	7,320	3,372	2,142	6,334
United Kingdom	64,755	52,905	59,165	48,986	58,014	55,595	32,041
United States	5,557	9,429	364	585	1,983	1,444	609
Other countries	2,417	5,102	7,603	2,882	2,213	4,219	....
Total	236,047	151,422	167,723	176,681	132,706	118,090	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 bushels.

BARLEY.

TABLE 50.—*Barley: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average [1] 1909–1913	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	7,619	7,565	7,148	7,757	8,933	9,740	7,198	8,083
Canada:								
New Brunswick	3	2	2	2	2	7	11	8
Quebec	99	85	85	73	165	189	235	194
Ontario	587	461	449	326	361	660	569	484
Manitoba	561	468	567	688	708	1,103	894	839
Saskatchewan	234	290	300	367	670	699	493	519
Alberta	185	178	304	337	472	470	414	481
Other	14	12	11	10	14	26	30	27
Total Canada	1,683	1,496	1,718	1,803	2,392	3,154	2,646	2,552
Mexico		292						
Total	9,302							
SOUTH AMERICA.								
Argentina	268	418	397	431	268			615
Chile	117	153	147	121	117	98	98	
Uruguay	4	14	5	10	13	6		5
Total	389	585	549	562	398			
EUROPE.								
Austria	[2] 2,712	[3] 1,729	[3] 1,578		268	255	233	
Hungary proper [2]	2,760	2,705	2,830					[4] 1,201
Croatia Slavonia [2]	158							
Bosnia Herzegovina [2]	214							
Belgium	85	84					75	87
Bulgaria [2]	616	587	590	560	593	604	[4] 474	[4] 502
Czecho-Slovakia							[5] 857	1,695
Denmark	591		644	633	592	548	569	585
Finland							293	293
France [2]	1,866	1,780	1,575	1,538	1,699	1,371	[6] 1,194	[6] 1,497
Alsace-Lorraine	121	117	115					
Germany [2]	3,976	3,909	4,002		[6] 3,738	[6] 3,640	[6] 3,081	[6] 3,273
Greece	195	186	198	[7] 297	[8] 390		300	
Italy	613	610	608	596	469	478	480	494
Jugo-Slavia								1,182
Luxemburg	3	4	4	5	7	7		
Netherlands	68	67	63	60	52	60	59	56
Norway	89		97	98	116	156	156	156
Roumania [2]	1,319	1,405	1,371	1,454		[9] 2,120	[10] 1,942	[11] 3,308
Russia proper [2]	23,075	25,260	22,325	22,031				
Poland [2]	1,249						[12] 1,413	[13] 2,078
Northern Caucasia [2]	3,735	4,495	4,400					
Serbia [2]	242							
Spain	3,509	3,404	3,786	3,886	4,086	4,209	4,254	4,265
Sweden	451	436	431	421	438	452	412	402
United Kingdom:								
England	1,400	1,420	1,152	1,245	1,365	1,395	1,406	1,538
Wales	88	84	80	87	95	106	104	99
Scotland	191	194	149	170	159	153	174	205
Ireland	165	172	142	150	177	185	187	208
Total United Kingdom	1,844	1,870	1,523	1,652	1,796	1,839	1,871	2,050
Total Europe	49,370							

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] New boundaries.
[5] Bohemia and Moravia
[6] Excludes Alsace-Lorraine.
[7] Excludes Macedonia.
[8] Excludes Eastern Macedonia.
[9] Includes Bessarabia but excludes Dobrudja.
[10] Former Kingdom, Bessarabia, and Bukowina.
[11] Former Kingdom, Bessarabia, Bukowina, and Transylvania.
[12] Includes Congress Poland, Western Galicia Eastern Galicia, and Posen.
[13] Unofficial.

BARLEY—Continued.

TABLE 50.—*Barley: Area and production in undermentioned countries, 1909–1920—Con.*

AREA—Continued.

Country.	Average[1] 1909–1913	1914	1915	1916	1917	1918	1919	1920
ASIA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
British India	7,836	7,098	7,821	7,924	7,883	8,323	....	....
Cyprus	....	....	....	....	....	....	....	....
Japanese Empire:								
Japan	3,183	3,294	3,213	3,075	2,888	2,862	2,931	2,691
Formosa	5	5	5	5	5	....	....	....
Korea	843	1,107	1,182	1,233	1,322	....	....	....
Total Japanese Empire	4,031	4,406	4,400	4,313	4,215	....	....	....
Russia:								
Central Asia (4 governments)[2]	368	485	350	....	....	....	....	....
Siberia (4 governments)[2]	459	630	651	....	....	....	....	....
Transcaucasia (1 government)[2]	2	2	2	....	....	....	....	....
Total Russia, Asiatic	829	1,117	1,003	....	....	....	....	....
Total Asia	12,696	12,621	13,224	....	....	....	....	....
AFRICA.								
Algeria	3,353	3,131	2,703	3,009	2,839	2,794	2,639	2,444
Egypt	394	....	463	439	445	336	357	340
Tunis	1,145	795	1,038	1,233	1,038	1,197	977	939
Union of South Africa	....	....	....	64	57	58	55	99
Total Africa	4,892	....	....	4,745	4,379	4,385	4,028	3,822
AUSTRALASIA.								
Australia:								
Queensland	7	9	7	1	13	8	....	....
New South Wales	12	21	5	6	5	6	6	....
Victoria	60	83	62	61	93	85	[3] 100	....
South Australia	46	91	66	85	104	96	[3] 136	....
Western Australia	6	11	7	10	11	5	[3] 8	....
Tasmania	6	8	6	5	5	5	....	....
Total	137	223	153	168	231	205	....	....
New Zealand	39	32	18	30	30	19	19	....
Total Australasia	176	255	171	198	261	224	....	....
Grand total	76,825	....	....	....	....	....	....	....

PRODUCTION.

Country.	Average[1] 1909–1913	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	181,881	194,953	228,851	182,309	211,759	256,225	161,345	202,024
Canada:								
New Brunswick	79	64	48	45	40	163	285	194
Quebec	2,382	2,261	2,255	1,456	3,064	4,551	5,344	4,910
Ontario	17,017	13,987	15,369	7,498	11,191	24,248	13,134	16,660
Manitoba	15,954	9,828	16,658	13,729	15,930	27,963	17,149	17,520
Saskatchewan	7,350	4,901	9,523	9,916	14,068	11,888	8,971	19,502
Alberta	5,364	4,806	9,822	9,774	10,386	7,756	10,562	12,739
Other	386	354	342	352	379	718	944	786
Total	48,532	36,201	54,017	42,770	55,058	77,287	56,389	63,311
Mexico	6,666	10,839	10,000	....	....	17,711	....	....
Total	237,079	241,993	292,868	....	....	351,223	....	....

[1] Five-year average except where five-year statistics were unavailable.
[2] Old boundaries.
[3] Uuofficial.

BARLEY—Continued.

TABLE 50.—*Barley: Area and production in undermentioned countries, 1909–1920*—Con.

PRODUCTION—Continued.

Country.	Average[1] 1909–1913	1914	1915	1916	1917	1918	1919	1920
SOUTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Argentina	3,626	8,037	5,144	5,430	2,165	...	...	[2] 10,279
Chile	3,924	5,567	3,827	4,358	4,840	3,304	3,977	[2] 4,080
Uruguay	61	165	40	115	110	108	...	73
Total	7,611	13,769	9,011	9,903	7,115	...	...	...
EUROPE.								
Austria	[3] 71,988	[4] 58,458	[4] 29,783	...	3,291	4,233	3,822	...
Hungary proper[3]	69,812	65,265	56,186	...	...	...	...	[5] 20,045
Croatia Slavonia[3]	2,540	1,940	1,938	...	...	...	...	...
Bosnia-Herzegovina[3]	3,455	3,000	3,000	...	...	...	...	...
Belgium	4,247	4,232	4,000	...	...	...	3,617	3,693
Bulgaria[3]	12,425	9,278	11,848	10,037	11,980	7,094	[5] 10,538	[5] 14,066
Czecho-Slovakia	...	...	...	...	...	...	[6] 20,648	38,617
Denmark	22,589	20,780	25,890	24,477	17,881	21,465	24,600	23,548
Finland	5,737	4,316	5,021	4,885	...	[2] 5,635	5,295	4,983
France[3]	46,489	42,719	31,787	38,268	37,265	27,475	[7] 23,626	[7] 35,399
Alsace-Lorraine	4,615	4,059	3,127	...	...	1,762	3,249	...
Germany[3]	153,529	144,125	114,077	...	[7] 89,886	[7] 103,720	[2,7] 83,000	[7] 87,741
Greece	3,692	3,094	2,891	[8] 3,957	[9] 5,796	2,500	5,020	7,183
Italy	10,104	6,917	11,051	10,109	7,422	9,686	8,327	5,870
Jugo-Slavia	...	...	...	...	...	...	...	20,654
Luxemburg	82	108	83	125	154	136	...	...
Netherlands	3,270	3,019	3,380	2,498	2,573	2,176	2,688	2,846
Norway	2,867	2,591	2,682	3,415	4,021	5,622	5,275	5,427
Roumania[3]	24,821	25,505	28,688	30,038	...	[10] 4,993	[11] 31,641	[12] 48,184
Russia proper[3]	372,856	310,249	316,904	350,223	...	...	...	...
Poland	[3] 27,150	...	...	...	...	...	[13] 27,843	[2] 40,326
Northern Caucasia[3]	67,191	73,323	...	...	...	...	...	...
Serbia[3]	5,072	3,000	2,250	...	...	...	...	...
Spain	74,689	72,272	82,763	86,863	76,747	90,496	81,808	90,462
Sweden	14,592	12,195	14,254	14,621	12,263	12,947	12,892	11,121
United Kingdom:								
England	47,352	48,205	34,898	40,022	42,897	45,328	40,592	47,864
Wales	2,812	2,743	2,467	2,731	2,781	3,312	3,200	2,824
Scotland	7,103	7,616	5,183	5,340	5,816	5,416	6,112	7,784
Ireland	7,493	8,073	5,828	6,474	7,796	8,024	8,125	7,527
Total	64,760	66,637	48,376	54,567	59,290	62,080	58,029	65,999
Total Europe	1,063,957	...	...	...	...	...	...	...
ASIA.								
British India	40,973	125,113	142,847	147,653	155,447	155,307	...	...
Cyprus	2,151	2,000	2,000	...	1,954	...	[2] 2,393	[2] 3,500
Japanese Empire:								
Japan	89,528	85,775	94,959	89,366	88,896	82,650	91,500	95,808
Formosa	53	60	61	50	50	...	...	...
Korea	19,436	23,708	26,527	24,577	25,988	27,751	26,480	...
Total Japan	109,017	109,543	121,547	113,993	114,934	...	...	...
Russia:								
Central Asia (4 governments)[3]	5,119	7,929	3,278	...	...	...	...	...
Siberia (4 governments)[3]	6,027	11,498	5,753	...	...	...	...	...
Transcaucasia (1 government)[3]	25	24	38	...	...	...	...	...
Total Russia (Asiatic)	11,171	19,151	9,069	...	...	...	...	...
Total Asia	163,312	256,107	275,463	...	...	...	...	...

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Unofficial.
[3] Old boundaries.
[4] Excludes Galicia and Bukowina.
[5] New boundaries.
[6] Bohemia and Moravia.
[7] Excludes Alsace-Lorraine.
[8] Excludes Macedonia.
[9] Excludes Eastern Macedonia.
[10] Includes Bessarabia, but excludes Dobrudja.
[11] Former Kingdom, Bessarabia, and Bukowina.
[12] Former Kingdom and Bessarabia.
[13] Includes Congress Poland, Western Galicia, Eastern Galicia, and Posen.

BARLEY—Continued.

TABLE 50.—*Barley: Area and production in undermentioned countries, 1909–1920*—Con.

PRODUCTION—Continued.

Country.	Average.[1] 1909–1913	1914	1915	1916	1917	1918	1919	1920
AFRICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Algeria	41, 961	35, 785	39, 866	35, 969	28, 529	60, 742	33, 667	14, 035
Egypt	....	11, 294	14, 013	13, 417	13, 863	10, 063	10, 283	7, 475
Tunis	7, 900	3, 215	11, 482	4, 914	8, 267	10, 426	5, 512	3, 169
Union of South Africa	2, 015	....	....	....	1, 000	2, 054	1, 623	1, 160
Total Africa	51, 876	....	....	....	51, 659	83, 285	51, 085	25, 839
AUSTRALASIA.								
Australia:								
Queensland	119	120	106	8	250	143	....	....
New South Wales	204	313	47	115	73	98	98	....
Victoria	1, 400	1, 870	601	1, 735	1, 800	1, 971	[2] 2, 029	....
South Australia	842	1, 375	447	1, 698	1, 734	1, 651	2, 498	....
Western Australia	70	173	24	131	134	36	[2] 81	....
Tasmania	184	193	105	116	89	98	....	....
Total	2, 819	4, 044	1, 330	3, 803	4, 080	3, 997	....	....
New Zealand	1, 402	1, 234	597	820	738	569	711	....
Total Australasia	4, 221	5, 278	1, 927	4, 623	4, 818	....	....	....
Grand total	1, 528, 056	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable. [2] Unofficial.

TABLE 51.—*Barley: World production, so far as reported, 1895–1916.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1895	915, 504, 000	1901	1, 072, 195, 000	1907	1, 271, 237, 000	1913	1, 650, 265, 000
1896	932, 100, 000	1902	1, 229, 132, 000	1908	1, 274, 897, 000	1914	1, 463, 289, 000
1897	864, 605, 000	1903	1, 235, 786, 000	1909	1, 458, 263, 000	1915	1, 522, 732, 000
1898	1, 030, 581, 000	1904	1, 175, 784, 000	1910	1, 388, 734, 000	1916	1, 529, 031, 000
1899	965, 720, 000	1905	1, 180, 053, 000	1911	1, 373, 286, 000		
1900	959, 622, 000	1906	1, 296, 579, 000	1912	1, 466, 977, 000		

TABLE 52.—*Barley: Average yield per acre in undermentioned countries, 1890–1920.*

Year.	United States.[1]	Russia (European).[1]	Germany.[1]	Austria.[1]	Hungary proper.[1]	France.[2]	United Kingdom.[2]
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1890–1899	23. 4	13. 3	29. 4	21. 1	....	22. 6	39. 8
1900–1909	25. 5	14. 3	35. 3	26. 3	23. 4	23. 6	35. 0
1910–1914	24. 6	15. 7	38. 0	29. 1	25. 0	24. 6	34. 4
1906	28. 3	13. 0	35. 2	26. 1	26. 8	20. 8	36. 1
1907	23. 8	14. 2	38. 2	27. 3	23. 1	24. 4	36. 8
1908	35. 1	14. 2	34. 9	25. 2	21. 3	22. 6	34. 9
1909	22. 5	17. 9	39. 5	28. 4	25. 1	25. 4	38. 9
1910	22. 5	16. 3	34. 4	24. 9	19. 7	23. 5	34. 3
1911	21. 0	14. 4	37. 0	27. 5	26. 9	25. 0	34. 0
1912	29. 7	16. 2	40. 7	29. 7	26. 9	26. 1	33. 1
1913	23. 8	18. 5	41. 3	29. 7	27. 6	24. 5	35. 1
1914	25. 8	12. 9	36. 8	33. 8	24. 1	24. 0	35. 6
1915	32. 0	14. 7	28. 4	18. 8	19. 7	19. 7	31. 8
1916	23. 6	16. 0	34. 2	19. 7	....	23. 8	33. 0
1917	23. 7	....	23. 8	....	....	[1] 26. 8	33. 9
1918	26. 3	....	28. 1	....	....	20. 3	33. 8
1919	22. 3	....		....	....	....	30. 9
1920	25. 7	....	....	....	....	....	....

[1] Bushels of 48 pounds. [2] Winchester bushels.

BARLEY—Continued.

TABLE 53.—*Barley: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Chicago cash price per bushel, low malting to fancy.[1] December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, fiscal year beginning July 1.	Imports, fiscal year beginning July 1.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Bushels.*	*Bushels.*
1849			*5,167,000*								
1859			*15,826,000*								
1866	493,000	22.9	11,284,000	70.2	7,916,000	59	70	85	100		3,247,250
1867	1,131,000	22.7	25,727,000	70.1	18,028,000	150	180	227	250	9,810	3,783,966
1868	937,000	24.4	22,896,000	109.0	24,948,000	140	170	149	175	9,077	5,069,880
1869	1,026,000	27.9	28,652,000	70.8	20,298,000	74	85	50	62	255,490	6,727,597
1869			*29,761,000*								
1870	1,109,000	23.7	26,295,000	79.1	20,792,000	68	80	72	95	340,093	4,866,700
1871	1,114,000	24.0	26,718,000	75.8	20,264,000	55½	64	55	71	86,891	5,565,591
1872	1,397,000	19.2	26,846,000	68.6	18,416,000	60	70	71	85	482,410	4,244,751
1873	1,387,000	23.1	32,044,000	86.7	27,794,000	132	158	130	155	320,399	4,891,189
1874	1,581,000	20.6	32,552,000	86.0	27,998,000	120	129½	115	137	91,118	6,255,063
1875	1,790,000	20.6	36,909,000	74.1	27,368,000	81	88	62½	72½	317,781	10,285,957
1876	1,767,000	21.9	38,710,000	63.0	24,403,000	63¾	68½	80	85	1,186,129	6,702,965
1877	1,669,000	21.4	35,638,000	62.5	22,287,000	56¼	64	46½	52½	3,921,501	6,764,228
1878	1,790,000	23.6	42,246,000	57.9	24,454,000	91	100	64	73	715,536	5,720,979
1879	1,681,000	24.0	40,283,000	58.9	23,714,000	86	92	75	80	1,128,923	7,135,258
1879	*1,998,000*	*22.0*	*43,997,000*								
1880	1,843,000	24.5	45,165,000	66.6	30,091,000	100	120	95	105	885,246	9,528,616
1881	1,968,000	20.9	41,161,000	82.3	33,863,000	101	107	100	100	205,930	2,182,722
1882	2,272,000	21.5	48,954,000	62.9	30,768,000	79	82	80	80	433,005	10,050,687
1883	2,379,000	21.1	50,136,000	58.7	29,420,000	62	67	65	74	724,955	8,596,122
1884	2,609,000	23.5	61,203,000	48.7	29,779,000	53	58	65	65	629,130	9,986,507
1885	2,729,000	21.4	58,360,000	56.3	32,868,000	62	65	58	60	252,183	10,197,115
1886	2,653,000	22.4	59,428,000	53.6	31,841,000	51	54	57	57	1,305,300	10,355,594
1887	2,902,000	19.6	56,812,000	51.9	29,464,000	80	80	69	77	550,884	10,831,461
1888	2,996,000	21.3	63,884,000	59.0	37,672,000					1,440,321	11,368,414
1889	3,221,000	24.3	78,333,000	41.6	32,614,000	58	58			1,408,311	11,332,545
1889	*3,221,000*	*24.3*	*78,333,000*								
1890	3,135,000	21.4	67,168,000	62.7	42,141,000					973,062	5,078,733
1891	3,353,000	25.9	86,839,000	52.4	45,470,000					2,800,075	3,146,328
1892	3,400,000	23.6	80,097,000	47.5	38,026,000	65	67	65	65	3,035,267	1,970,129
1893	3,220,000	21.7	69,869,000	41.1	28,729,000	52	54	55	60	5,219,405	791,061
1894	3,171,000	19.4	61,400,000	44.2	27,134,000	53½	55½	51	52	1,563,754	2,116,816
1895	3,300,000	26.4	87,073,000	33.7	29,312,000	33	40	25	36	7,680,331	837,384
1896	2,951,000	23.6	69,695,000	32.3	22,491,000	22	37	24½	35	20,030,301	1,271,787
1897	2,719,000	24.5	66,685,000	37.7	25,142,000	25½	42	36	53	11,237,077	124,804
1898	2,583,000	21.6	55,792,000	41.3	23,064,000	40	50½	36	42	2,267,403	110,475
1899	2,878,000	25.5	73,382,000	40.3	29,594,000	35	45	36	44	23,661,662	189,757
1899	*4,470,000*	*26.8*	*119,635,000*								
1900	2,894,000	20.4	58,926,000	40.9	24,075,000	37	61	37	57	6,293,207	171,004
1901	4,296,000	25.6	109,933,000	45.2	49,705,000	56	63	64	72	8,714,268	57,406
1902	4,661,000	29.0	134,954,000	45.9	61,899,000	36	70	48	56	8,429,141	56,462
1903	4,993,000	26.4	131,861,000	45.6	60,166,000	42	61½	38	59	10,881,627	90,708
1904	5,146,000	27.2	139,749,000	42.0	58,652,000	38	52	40	50	10,661,655	81,020
1905	5,096,000	26.8	136,551,000	40.5	54,993,000	37	53	42	55½	17,729,360	18,049
1906	6,324,000	28.3	178,916,000	41.5	74,236,000	44	56	66	85	8,238,842	38,319
1907	6,448,000	23.8	153,597,000	66.6	102,290,000	78	102	60	75	4,349,078	199,741
1908	6,646,000	25.1	166,756,000	55.4	92,442,000	57	64½	66	75	6,580,393	2,644
1909	7,011,000	24.3	170,284,000								
1909	*7,699,000*	*22.5*	*173,344,000*	54.0	93,539,000	55	72	50	68	4,311,566	
1910[2]	7,743,000	22.5	173,832,000	57.8	100,426,000	72	90	75	115	9,399,346	
1911	7,627,000	21.0	160,240,000	86.9	139,182,000	102	130	68	132	1,585,242	
1912	7,530,000	29.7	223,824,000	50.5	112,957,000	43	77	45	68	17,536,703	
1913	7,499,000	23.8	178,189,000	53.7	95,731,000	50	79	51	66	6,644,747	
1914	7,565,000	25.8	194,953,000	54.3	105,903,000	60	75	74½	82	26,754,522	
1915	7,148,000	32.0	228,851,000	51.6	118,172,000	62	77	70	83	27,473,160	
1916	7,757,000	23.5	182,309,000	88.1	160,646,000	95	125	128	165	16,381,077	
1917	8,933,000	23.7	211,759,000	113.7	240,758,000	125	163	105	176	26,285,378	
1918	9,740,000	26.3	256,225,000	91.7	234,942,000	88	105	110	130	20,457,781	
1919	7,198,000	22.4	161,345,000	121.0	195,299,000	125	168	140	190	26,671,284	
1920	8,083,000	25.0	202,024,000	70.7	142,931,000	50	98				

[1] Prices 1895 to 1908 for No. 3 grade.

[2] Figures adjusted to census basis.

BARLEY—Continued.

TABLE 54.—*Barley: Revised acreage, production, and farm value, 1879 and 1889–1909.*

[See headnote of Table 5.]

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1879	*1,998,000*	24.4	48,721,000	59.4	28,928,000
1889	*3,221,000*	24.3	78,213,000	41.6	32,574,000
1890	3,406,000	21.4	73,017,000	62.6	45,719,000
1891	3,705,000	26.1	96,589,000	51.8	50,051,000
1892	3,892,000	23.6	92,037,000	46.5	42,790,000
1893	3,855,000	21.7	83,700,000	40.5	33,922,000
1894	4,005,000	19.5	78,051,000	43.5	33,924,000
1895	4,263,000	26.9	114,732,000	32.0	36,678,000
1896	4,172,000	23.8	99,394,000	30.0	29,814,000
1897	4,150,000	24.9	103,279,000	35.2	36,346,000
1898	4,237,000	23.5	99,490,000	38.9	38,701,000
1899	*4,470,000*	26.1	116,552,000	39.0	45,479,000
1900	4,545,000	21.1	96,041,000	40.5	38,896,000
1901	4,742,000	25.7	121,784,000	45.2	55,068,000
1902	5,126,000	29.1	149,389,000	45.5	67,944,000
1903	5,568,000	26.4	146,864,000	45.4	66,700,000
1904	5,912,000	27.4	162,105,000	41.6	67,427,000
1905	6,250,000	27.2	170,174,000	39.4	67,005,000
1906	6,730,000	28.6	192,270,000	41.6	80,069,000
1907	6,941,000	24.5	170,008,000	66.3	112,675,000
1908	7,294,000	25.3	184,857,000	55.2	102,037,000
1909	*7,699,000*	24.4	187,973,000	54.8	102,947,000

TABLE 55.—*Barley: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Dollars.*		*Acres.*	*Bushels.*	*Dollars.*
Maine	4	104	144	Kansas	838	21,285	9,578
New Hampshire	1	27	39	Kentucky	4	112	129
Vermont	12	336	403	Tennessee	9	225	248
New York	120	3,480	3,445	Texas	11	253	190
Pennsylvania	20	480	432	Oklahoma	130	3,120	2,246
Maryland	6	165	182	Montana	77	1,540	1,001
Virginia	15	405	405	Wyoming	28	1,008	1,109
Ohio	102	2,825	2,316	Colorado	190	4,674	3,506
Indiana	75	2,025	1,762	New Mexico	21	630	472
Illinois	200	6,080	4,986	Arizona	20	680	952
Michigan	240	6,240	5,429	Utah	17	685	685
Wisconsin	502	15,913	13,367	Nevada	8	304	502
Minnesota	1,000	25,000	15,500	Idaho	112	4,256	3,192
Iowa	284	7,810	4,920	Washington	110	3,883	3,883
				Oregon	80	2,576	2,576
Missouri	8	224	220	California	1,250	28,750	28,750
North Dakota	1,260	22,680	12,701				
South Dakota	1,073	26,825	13,949	United States	8,083	202,024	142,931
Nebraska	256	7,424	3,712				

BARLEY—Continued.

TABLE 56.—*Barley: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911-1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911-1920.	1916	1917	1918	1919	1920	5-year average, 1915-1919.	1920
Me	26.5	28.0	26.2	28.0	30.0	26.5	26.0	21.0	25.0	28.0	26.0	109	104	130	149	170	138	31.81	35.88
N. H	27.9	24.0	28.0	28.0	32.0	30.0	28.0	25.0	32.0	25.0	27.0	116	90	175	150	188	146	37.53	39.42
Vt	30.8	30.5	35.0	32.0	34.5	35.0	27.5	29.0	31.0	25.0	28.0	106	100	140	153	150	120	35.86	33.60
N. Y	27.2	25.0	26.0	26.7	28.0	32.0	23.3	28.0	31.5	22.0	29.0	97	101	130	126	136	99	30.71	28.71
Pa	26.6	25.0	27.5	26.0	28.0	29.5	25.0	28.0	28.0	24.5	24.0	90	75	140	120	128	90	29.01	21.60
Md	29.4	23.0	27.0	29.0	33.0	34.0	32.0	25.0	31.0	33.0	27.5	88	73	130	120	123	110	31.49	30.25
Va	26.6	23.0	25.0	26.0	26.0	29.0	27.5	30.0	27.0	25.0	27.0	98	85	139	160	130	100	32.51	27.00
Ohio	28.3	27.2	31.0	24.0	25.0	31.0	27.8	33.0	31.5	25.2	27.7	81	80	118	93	125	82	27.74	22.71
Ind	28.0	26.5	29.5	25.0	25.0	28.0	27.0	30.5	37.0	25.0	27.0	80	75	104	104	118	87	27.63	23.49
Ill	31.2	28.0	31.5	26.0	29.5	34.0	32.0	37.5	36.0	27.0	30.4	84	103	121	90	121	82	32.56	24.93
Mich	25.4	24.0	26.0	24.8	26.0	29.5	24.5	24.4	30.0	19.0	26.0	85	91	119	100	118	87	24.41	22.62
Wis	29.9	25.5	29.4	25.0	27.3	35.5	30.0	32.0	35.7	26.5	31.7	86	105	124	92	121	84	31.19	26.63
Minn	24.7	19.0	28.2	24.0	23.0	30.5	19.0	27.0	31.0	20.0	25.0	74	87	111	80	116	62	21.89	15.50
Iowa	28.4	21.9	31.0	25.0	26.0	31.0	29.5	35.0	31.5	25.5	27.5	77	91	117	85	112	63	27.66	17.32
Mo	24.4	20.0	24.8	22.0	24.0	25.0	20.0	25.0	25.0	30.0	28.0	86	93	94	115	130	98	25.12	27.44
N. Dak	20.0	19.5	29.9	20.0	19.5	32.0	15.5	12.5	21.5	11.5	18.0	67	80	100	73	108	56	13.42	10.08
S. Dak	23.0	5.4	26.0	17.5	23.0	32.0	22.7	27.0	29.5	22.0	25.0	71	83	110	78	115	52	22.31	13.00
Nebr	22.9	11.0	22.0	16.0	23.5	31.0	28.0	26.5	16.5	25.7	29.0	65	75	98	85	100	50	19.94	14.50
Kans	18.0	6.5	23.5	8.1	24.5	31.0	16.0	8.0	10.0	27.0	25.4	68	77	115	95	100	45	14.21	11.43
Ky	27.5	28.7	26.0	26.6	28.5	30.0	26.0	28.0	28.0	25.0	28.0	100	90	115	140	157	115	31.43	32.20
Tenn	23.9	28.0	26.0	25.0	27.0	24.0	23.7	15.0	23.0	22.0	25.0	108	100	144	152	180	110	27.57	27.50
Texas	23.6	18.0	29.3	24.0	25.0	28.0	17.0	20.0	17.0	35.0	23.0	92	80	137	130	112	75	24.27	17.25
Okla	19.2	10.0	20.0	9.0	25.0	26.5	12.5	18.0	17.0	30.0	24.0	86	100	148	124	122	72	22.01	17.28
Mont	25.8	34.5	36.5	31.0	30.5	34.0	28.0	15.0	22.0	6.0	20.0	75	76	103	100	140	65	16.69	13.00
Wyo	32.4	34.0	34.0	30.5	33.0	36.0	33.0	36.0	37.0	15.0	36.0	95	87	130	130	175	110	33.93	39.60
Colo	30.2	29.0	39.0	32.5	38.5	36.0	32.0	33.0	18.0	19.5	24.6	77	82	104	113	120	75	24.32	18.45
N. Mex	30.7	33.0	35.0	24.0	34.0	33.0	28.0	28.0	28.0	34.0	30.0	89	100	139	110	110	75	31.64	22.50
Ariz	36.2	36.5	40.0	39.0	36.0	37.0	35.0	35.0	34.0	35.0	34.0	103	108	150	130	140	140	40.84	47.60
Utah	39.2	43.0	45.0	38.5	45.0	42.5	36.0	37.0	35.0	30.0	40.3	86	76	120	140	141	100	37.03	40.30
Nev	40.0	40.0	41.0	41.0	47.0	48.0	41.0	35.0	34.0	35.0	38.0	108	95	119	154	150	165	43.81	62.70
Idaho	37.0	42.0	43.5	42.0	38.0	40.5	39.0	29.0	28.0	30.0	38.0	80	82	105	130	140	75	32.38	28.50
Wash	35.2	37.0	43.0	40.5	39.0	41.5	41.3	29.0	15.2	30.0	35.3	83	84	115	115	135	100	29.85	35.30
Oreg	31.9	34.0	36.0	35.0	30.0	36.0	38.5	29.0	25.0	23.1	32.2	88	80	115	136	150	100	31.02	32.20
Calif	27.9	28.0	30.0	26.0	30.0	29.0	28.0	29.0	26.0	30.0	23.0	92	95	120	115	141	100	30.32	23.00
U. S	25.3	21.0	29.7	23.8	25.8	32.0	23.5	23.7	26.3	22.4	25.0	78.2	88.1	113.7	91.7	121.0	70.7	23.09	17.68

[1] Based upon farm price Dec. 1.

TABLE 57.—*Barley: Condition of crop, United States, on first of months named, 1899–1920.*

Year.	June.	July.	August.	When harvested.	Year.	June.	July.	August.	When harvested.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1899	91.4	92.0	93.6	86.7	1910	89.6	73.7	70.0	69.8
1900	86.2	76.3	71.6	70.7	1911	90.2	72.1	66.2	65.5
1901	91.0	91.3	86.9	83.8	1912	91.1	88.3	89.1	88.9
1902	93.6	93.7	90.2	89.7	1913	87.1	76.6	74.9	73.4
1903	91.5	86.8	83.4	82.1	1914	95.5	92.6	85.3	82.4
1904	90.5	88.5	88.1	87.4	1915	94.6	94.1	93.8	94.2
1905	93.7	91.5	89.5	87.8	1916	86.3	87.9	80.0	74.6
1906	93.5	92.5	90.3	89.4	1917	89.3	85.4	77.9	76.3
1907	84.9	84.4	84.5	78.5	1918	90.5	84.7	82.0	81.5
1908	89.7	86.2	83.1	81.2	1919	91.7	87.4	73.6	69.2
1909	90.6	90.2	85.4	80.5	1920	87.6	87.6	84.9	82.5

BARLEY—Continued.

TABLE 58.—*Barley: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	18.0	3.4	.5	.2	1.8	3.8	.3	28.2	5.3	4.3	.1	.1	38.5
1918	20.7	.4	.1	.7	1.1	2.3	.3	25.9	.6	1.6	.2	[1]	28.8
1917	26.6	.8	[1]	1.0	1.1	2.3	.2	32.1	.5	.4	.1	.1	33.6
1916	8.0	3.4	.3	.7	1.5	5.0	.5	20.2	8.5	.7	.1	.1	30.6
1915	1.3	3.2	.3	.7	1.7	.3	.5	8.0	.9	.2	.2	.1	10.0
1914	8.2	2.3	.2	.6	1.5	4.6	.4	18.4	2.3	.6	.2	.1	22.7
1913	24.5	.7	.1	.4	1.0	3.2	.3	31.1	.2	1.2	.2	.2	34.3
1912	8.4	1.8	.1	.9	1.9	1.7	.5	15.9	.9	.5	.5	.3	19.6
1911	30.0	1.2	......	.8	.4	5.7	.1	38.1	.9	.9	.3	.2	41.3
1910	34.0	.2	.1	.9	.9	4.3	.1	40.7	.4	.8	.5	.1	43.1
1909	8.9	3.6	.3	1.0	2.1	2.3	.8	19.0	1.4	.4	.5	.2	22.8
Average	17.1	1.8	.1	.8	1.3	3.2	.4	24.9	1.7	.7	.3	.1	28.7

[1] Less than 0.05 per cent.

TABLE 59.—*Barley: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	130.2	91.3	126.5	87.1	54.9	54.3	52.2	49.9	86.4	59.8	79.3
Feb. 1	137.1	86.8	131.9	92.7	61.7	62.9	52.4	51.4	91.2	64.1	83.2
Mar. 1	129.3	85.4	161.1	96.9	59.6	67.7	51.1	49.0	91.0	63.0	85.4
Apr. 1	140.0	92.7	170.2	102.3	57.2	64.7	51.7	48.5	92.3	69.1	88.9
May 1	146.4	103.9	158.5	120.1	59.6	63.8	49.3	48.3	96.2	74.0	92.0
June 1	148.3	109.2	135.4	119.3	59.6	62.0	49.1	52.7	91.1	73.8	90.0
July 1	142.0	108.4	118.4	106.6	59.3	55.8	47.5	53.7	81.9	70.1	84.4
Aug. 1	121.0	118.7	110.0	114.5	59.3	56.7	45.1	50.8	66.8	69.3	81.2
Sept. 1	105.0	115.6	100.9	110.0	72.9	51.9	52.5	55.2	53.5	77.0	79.4
Oct. 1	91.2	115.3	95.5	113.9	76.5	46.8	51.8	56.8	54.8	81.7	78.4
Nov. 1	81.7	117.1	94.9	111.3	83.2	50.1	51.7	54.7	53.8	84.9	78.3
Dec. 1	70.7	121.0	91.7	113.7	88.1	51.6	54.3	53.7	50.5	86.9	78.2
Average	106.9	108.9	112.6	107.7	71.0	54.1	51.5	53.3	66.9	75.2	80.8

BARLEY—Continued.

TABLE 60.—*Barley: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Cincinnati.			Chicago.			Milwaukee.			Minneapolis.			San Francisco.		
	Spring malt.[1]			Low malting to fancy.[2]			No. 3.[3]			All grades.			Feed (per 100 lbs.).		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June	70	86	79.1	42	71	57.0	53	73	61.8	39	63	50.9	128	150	137.0
July-December	87	92	89.5	43	85	66.2	58	60	68.4	42	73	56.9	123¾	142½	132.0
1914.															
anuary-June	60	70	64.5	49	79	60.6	53	68	61.0	41	65	51.1	90	132½	109.2
July-December	70	80	75.3	50	82	65.6	51½	82	67.9	40	76	56.6	95	130	110.0
1915.															
January-June	72	102	83.9	66	91	78.1	70½	93	78.9	58	86	70.7	100	162½	131.6
July-December	70	102	83.0	51	85	65.6	54	81	66.9	42	78	58.9	100	132½	121.7
1916.															
January-June	83	102	93.8	64	86	74.6	68	82	75.7	59	76½	67.4	127½	136¼	131.7
July-December	93	145	124.2	68	128	99.4	70	128	106.3	57	112	82.4	127½	225	17.3
1917.															
January-June	135	182	161.3	102	165	130.4	120½	166	139.2	85	155	114.6	215	305	236.3
July-December	147	185	168.3	112	163	136.2	120	162	139.5	88	160	132.1	205	285	241.3
1918.															
January-June	172	256	205.8	100	243	163.0	115	239	171.2	85	237	154.3	280	350	315.5
July-December	108	208	153.2	80	128	99.9	93	125	105.8	80	130	94.4	210	222½	215.7
1919.															
January-June	108	139	119.6	70	130	106.7	88	133	11.5	70	119	97.0	185	290	229.6
July-December	130	165	145.2	100	168	136.3	119	167	142.6	100	162	123.9	280	350	315.2
1920.															
January	158	165	161.5	132	160	149.0	147	161	153.6	118	156	135.5	332½	365	354.7
February	150	158	154.1	120	153	138.9	132	151	143.8	111	144	126.9	335	355	345.7
March	150	165	158.6	131	167	152.0	143	164	157.6	118	158	141.0	315	350	338.5
April	167	185	176.8	150	182	166.9	161	176	167.6	128	172	148.6	290	325	307.5
May	175	193	182.9	140	190	169.3	160	184	174.4	125	180	155.1	320	350	340.1
June	175	187	179.7	141	170	153.7	146	169	157.9	118	161	136.4	320	350	333.3
January-June	150	193	168.9	120	190	155.0	132	184	159.2	111	180	140.6	290	365	336.6
July	177	184	175.0	85	150	121.6	103	148	123.7	85	143	109.0	250	305	271.0
August	.....	.....	.....	93	119	109.1	100	119	113.0	80	115	96.2	215	270	234.0
September	124	130	126.7	80	118	101.5	99	121	109.3	67	108	90.0	205	240	222.2
October	96	100	97.4	77	109	94.1	93	112	104.4	63	98	83.0	195	220	206.3
November	95	115	105.0	57	112	89.1	98	112	106.8	51	98	75.2	200	227½	217.3
December	95	105	100.0	50	98	78.5	87	102	96.5	50	79	64.2	130	202½	153.7
July-December	95	184	120.8	50	150	99.0	87	148	109.0	50	143	86.3	130	305	217.4

[1] No. 2 spring January-July, 1919 No. 3 spring September, 1919, to December, 1920, inclusive.
[2] All grades, September to December, 1919.
[3] No. 4, September to December, 1919.

BARLEY—Continued.

TABLE 61.—*Barley (including malt): International trade, calendar years, 1911–1919.*[1]

[See "General note," Table 15.]

EXPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Algeria	4,720	3,530	1,302	5,992	1,758	3,743	15,696
Argentina	917	1,152	3,440	3,104	566	218	1,871
Austria-Hungary	18,271	....	....	....	....	....	....
Belgium	3,853	....	....	....	....	....	320
British India	17,129	1,290	7,441	7,705	14,531	14,848	598
Bulgaria	1,700	....	....	....	....	....	....
Canada	6,670	6,843	4,677	9,980	7,218	4,556	13,172
Chile	631	3,051	1,557	1,149	1,054	1,450	....
China	660	524	191	45	61	97	....
Denmark	3,561	3,582	167	642	32	437	....
France	639	357	1,173	627	590	96	354
Germany	1,225	....	....	....	....	....	....
Netherlands	29,611	13,784	151	(2)	23	(2)	44
Roumania	16,692	9,284	....	....	....	....	....
Russia	168,461	90,930	643	488	....	....	....
United Kingdom	932	902	3,699	1,593	478	65	154
United States	8,400	18,870	28,578	27,152	21,644	19,620	46,745
Other countries	15,569	1,281	2,683	3,782	1,639	3,518	....
Total	299,641	155,380	55,702	62,259	49,594	47,198	....

IMPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	1,310	1,032	656	988	764	885	1,123
Austria-Hungary	839	....	....	....	....	....	....
Belgium	20,236	....	....	....	....	....	2,264
Brazil	978	639	865	655	691	309	622
British South Africa	351	265	216	264	138	34	60
Canada	166	136	82	10	36	8	75
Cuba	278	285	343	347	437	273	....
Denmark	2,098	2,413	4,995	1,104	466	12	....
Egypt	889	512	452	224	73	1	107
France	7,155	4,938	4,374	10,442	9,440	11,022	15,247
Finland	526	292	530	486	23	....	....
Germany	153,54[illegible]	....	....	....	....	....	....
Italy	815	1,050	633	513	1,530	7,604	1,306
Netherlands	41,184	23,994	6,569	5,846	2,360	136	7,325
Norway	4,333	4,007	1,368	2,465	2,255	557	....
Russia	974	781	271	1	....	....	....
Switzerland	4,440	3,556	2,641	2,268	1,479	616	1,370
United Kingdom	51,727	36,547	27,976	36,957	21,462	11,725	38,824
Other countries	2,253	2,264	1,405	978	1,542	823	....
Total	294,096	82,711	53,376	63,548	42,696	34,005	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 bushels.

RYE.

TABLE 62.—*Rye: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average [1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	2,236	2,541	3,129	3,213	4,317	6,391	7,103	5,043
Canada:								
Quebec	14	9	9	8	22	29	33	28
Ontario	77	78	78	69	68	113	140	133
Manitoba	5	5	12	30	37	240	299	149
Saskatchewan	3	3	7	23	53	124	190	172
Alberta	12	16	6	18	31	48	84	161
Other	1	(2)	(2)	(2)	1	1	7	7
Total Canada	112	111	112	148	212	555	753	650
Mexico	...	...	...	...	...	...	...	...
Total	2,348	...	...	...	...	...	...	...
SOUTH AMERICA.								
Argentina	68	228	229	212	180	...	...	...
Chile	6	6	4	11	6	8	8	...
Uruguay	(2)	(2)	(2)	(2)	(2)	(2)	(2)	...
Total	74	234	233	223	186	...	...	...
EUROPE.								
Austria	[3] 5,019	[4] 3,138	[4] 3,120	[5] 3,866	820	773	717	...
Hungary proper [3]	2,601	2,638	2,625	...	...	...	...	[6] 1,248
Croatia-Slavonia [3]	185	163	...	...	...	...	...	...
Bosnia-Herzegovina [3]	39	...	...	...	...	...	...	...
Belgium	644	645	...	...	...	...	496	506
Bulgaria [3]	530	527	507	465	442	475	[6] 446	[6] 417
Czecho-Slovakia	...	...	...	...	...	1,922	[7] 1,816	2,184
Denmark	632	607	521	481	436	543	559	519
Finland	[8] 592	...	...	...	...	...	602	602
France [3]	2,960	2,614	2,309	2,149	1,834	1,746	[9] 1,907	[9] 2,001
Alsace-Lorraine	135	139	116	...	...	67	130	...
Germany [3]	15,387	15,565	15,843	[9] 4,737	[9] 13,650	[9] 14,200	[9] 10,842	[9] 10,703
Greece	[10] 13	12	13	[11] 16	[12] 56	...	58	...
Italy	303	303	294	285	279	270	272	281
Jugo-Slavia	...	...	...	...	...	682	682	948
Luxemburg	26	26	24	23	17	17	26	...
Netherlands	557	563	546	499	463	472	481	489
Norway	37	...	48	48	58	37	37	37
Roumania [3]	317	208	187	200	...	[13] 624	[14] 748	[15] 680
Russia proper [3]	64,575	65,967	59,766	55,637	...	...	...	...
Poland	[3] 5,261	[16] 1,676	...	...	...	...	[17] 8,424	[17] 8,162
Northern Caucasia [3]	547	439	328	...	...	...	...	...
Serbia [3]	114	74	...	...	...	...	...	...
Spain	1,987	1,887	1,820	1,846	1,805	1,818	1,809	1,920
Sweden	977	981	965	913	819	948	919	914
Switzerland	60	61	66	44	49	49	54	50
United Kingdom	61	67	62	60	64	116	122	108
Total	103,424	...	...	...	...	...	...	...
ASIA.								
Russia:								
Central Asia (4 governments) [3]	176	133	340	...	...	...	...	...
Siberia (4 governments) [3]	2,273	2,676	2,452	...	...	...	...	...
Transcaucasia (1 government) [3]	2	1	1	...	...	...	...	...
Total Russia	2,451	2,810	2,793	...	...	...	...	...

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Less than 500 acres.
[3] Old boundaries.
[4] Excludes Galicia and Bukowina.
[5] Includes Galicia, but excludes Bukowina, Goritz, and Gradisca.
[6] New boundaries.
[7] Bohemia and Moravia.
[8] Census of 1910.
[9] Excludes Alsace-Lorraine.
[10] 1914.
[11] Excludes Macedonia.
[12] Excludes Eastern Macedonia.
[13] Includes Bessarabia; excludes Dobrudja.
[14] Former Kingdom, Bessarabia, and Bukowina.
[15] Former Kingdom, Bessarabia, Bukowina, and Transylvania.
[16] Winter rye in 5 governments only.
[17] Unofficial.

RYE—Continued.

TABLE 62.—*Rye: Area and production in undermentioned countries, 1909–1920*—Contd.

AREA—Continued.

Country.	Average.[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
AUSTRALASIA.								
Australia:	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
Queensland	(2)	(2)	(2)	(2)	(2)	....	(2)	....
New South Wales	4	5	3	3	2	(2)	1	....
Victoria	2	2	2	3	3	2	1	....
South Australia	1	1	1	3	2	(2)	1	....
Western Australia	1	1	1	1	1	(2)	(2)	....
Tasmania	1	1	1	1	1	(2)	(2)	....
Total	9	10	8	11	9	5	4	....
New Zealand	5	....	....	....	....	(2)	(2)	....
Total Australasia	14	....	....	....	....	....	....	....
Grand total	108,311	....	....	....	....	....	....	....

PRODUCTION.

Country.	Average.[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	34,916	42,799	54,050	48,862	62,933	91,041	88,909	69,318
Canada:								
Quebec	234	156	145	118	376	472	578	534
Ontario	1,405	1,341	1,551	1,208	1,207	1,813	2,219	2,350
Manitoba	96	100	208	557	638	3,936	4,089	2,319
Saskatchewan	55	54	203	548	998	1,420	2,000	2,535
Alberta	297	360	375	440	633	826	1,173	3,420
Other	9	6	4	5	5	37	148	148
Total	2,096	2,017	2,486	2,876	3,857	8,504	10,207	11,306
Mexico	70	70	70	70	....	....	....	....
Total	37,082	44,886	56,606	51,808	....	....	....	....
SOUTH AMERICA.								
Argentina	949	3,346	1,811	2,008	858	....	....	....
Chile	144	151	185	187	92	176	192	....
Uruguay	1	5	1	1	1	1	1	....
Total	1,094	3,502	1,997	2,196	951	....	....	....
EUROPE.								
Austria	[3] 112,752	[4] 74,555	[4] 51,211	[5] 50,233	10,922	10,604	9,035	....
Hungary proper[3]	48,716	42,410	45,975	....	....	....	....	[6] 16,520
Croatia-Slavonia[3]	2,231	2,082	2,500	....	....	....	....	....
Bosnia-Herzegovina[3]	444	500	600	....	....	....	....	....
Belgium	22,675	23,137	18,000	....	5,008	5,132	13,681	13,701
Bulgaria[3]	8,553	6,200	7,107	5,356	5,901	4,427	[6] 6,490	[6] 8,931
Czecho-Slovakia	....	....	....	....	....	....	32,734	33,439
Denmark	18,098	10,905	13,001	10,569	8,870	12,726	14,909	12,613
Finland	11,174	11,291	11,270	9,899	....	[7] 11,031	10,505	9,173
France[3]	48,647	32,002	33,148	33,351	24,768	28,935	[8] 28,736	[8] 33,174
Alsace-Lorraine	3,476	3,041	2,286	....	....	1,165	1,841	....
Germany[3]	445,222	410,478	360,310	[8] 350,486	[8] 274,677	[8] 315,301	[8] 240,161	[8] 189,556
Greece	[9] 218	138	126	[10] 157	[11] 695	....	1,081	1,307
Italy	5,328	5,260	4,362	5,342	4,460	[7] 5,232	4,571	4,539
Jugo-Slavia	....	....	....	....	....	....	9,816	18,125
Luxemburg	651	561	497	436	292	422	....	....
Netherlands	16,422	13,471	13,726	12,391	11,958	13,022	14,057	14,222

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Less than 500 acres.
[3] Old boundaries.
[4] Excludes Galicia and Bukowina.
[5] Includes Galicia, excludes Bukowina, Goritz, and Gradisca.
[6] New boundaries.
[7] Unofficial.
[8] Excludes Alsace-Lorraine.
[9] 1914.
[10] Excludes Macedonia.
[11] Excludes eastern Macedonia.

RYE—Continued.

TABLE 62.—*Rye: Area and production in undermentioned countries, 1909–1920*—Contd.

PRODUCTION—Continued.

Country.	Average,[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
EUROPE—continued.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Norway	974	1,046	829	943	1,159	1,012	984	990
Roumania [2]	4,652	1,959	2,911			[3] 1,694	[4] 10,046	[5] 5,750
Russia proper [2]	791,333	787,625	875,422	843,740				
Poland	[2] 90,494	[2] [6] 27,984					[7] 134,717	[7] 82,082
Portugal				2,761	[7] 2,894			
Northern Caucasia [2]	7,409	5,469	4,615					
Serbia [2]	1,533	1,000	800					
Spain	27,635	23,950	26,102	28,782	24,365	30,445	23,296	27,830
Sweden	23,859	27,599	23,133	22,929	14,080	19,794	23,074	24,959
Switzerland	1,783	1,724	2,059	1,279	1,468	1,850	1,748	1,622
United Kingdom	1,751	1,800	1,700					
Total Europe	1,692,554							
ASIA.								
Russia:								
Central Asia (4 governments) [2]	1,001	1,206	2,785					
Siberia (4 governments) [2]	23,647	35,887	20,143					
Transcaucasia (1 government) [2]	15	11	17					
Total Russia, Asiatic	24,663	37,104	22,945					
AUSTRALASIA.								
Australia:								
Queensland	2	1	1	1	2		([8])	
New South Wales	49	70	36	32	31		12	
Victoria	24	20	13	43	43	17	7	
South Australia	10	13	6	31	11	4	6	
Western Australia	5	4	3	4	4	1	2	
Tasmania	18	9	9	17	7		6	
Total	108	117	68	128	98	46	33	
New Zealand	97							
Total Australasia	205							
Grand total	1,755,598							

[1] Five year average except in a few cases where five year statistics were unavailable.
[2] Old boundaries.
[3] Includes Bessarabia, but excludes Dobrudja.
[4] Former Kingdom, Bessarabia, and Bukowina.
[5] Former Kingdom and Bessarabia.
[6] Winter rye in five governments only.
[7] Unofficial.
[8] Less than 500 bushels.

TABLE 63.—*Rye: World production so far as reported, 1895–1915.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1895	1,468,212,000	1901	1,416,022,000	1907	1,538,778,000	1913	1,880,387,000
1896	1,499,250,000	1902	1,647,845,000	1908	1,590,057,000	1914	1,596,882,000
1897	1,300,645,000	1903	1,659,961,000	1909	1,747,123,000	1915	1,577,490,000
1898	1,461,171,000	1904	1,742,112,000	1910	1,673,473,000		
1899	1,583,179,000	1905	1,495,751,000	1911	1,753,933,000		
1900	1,557,634,000	1906	1,433,395,000	1912	1,886,517,000		

RYE—Continued.

TABLE 64.—*Rye: Average yield per acre in undermentioned countries, 1890–1920.*

Year.	United States.[1]	Russia (European).[1]	Germany.[1]	Austria.[1]	Hungary proper.[1]	France.[2]	Ireland.[1]
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1890–1899	13.9	10.4	20.9	16.1	....	17.6	25.2
1900–1909	15.7	11.5	25.6	19.0	17.6	17.1	27.5
1910–1914	16.3	12.5	28.3	22.2	18.5	16.1	29.9
1906	16.7	8.8	25.1	19.9	19.8	16.3	27.6
1907	16.4	10.8	25.8	18.9	16.0	18.2	27.0
1908	16.4	11.0	28.0	22.0	17.5	16.8	29.2
1909	13.4	12.6	28.8	22.3	17.8	18.1	30.8
1910	16.0	12.3	27.1	21.3	18.9	14.7	30.3
1911	15.6	10.5	28.2	20.9	18.7	15.8	29.0
1912	16.8	14.3	29.5	23.3	19.4	16.5	30.6
1913	16.2	13.5	30.4	22.0	19.6	17.0	30.0
1914	16.8	12.1	26.4	23.7	16.1	16.6	29.4
1915	17.3	14.6	22.8	16.4	17.5	14.3	29.2
1916	15.3	15.1	23.7	13.1	....	15.4	29.0
1917	14.6	....	20.1	....	....	[1] 13.7	29.2
1918	14.2	....	22.1	....	....	17.2	27.1
1919	12.5	....	....	....	....	....	....
1920	14.2	....	....	....	....	....	....

[1] Bushels of 56 pounds. [2] Winchester bushels.

TABLE 65.—*Rye: Acreage, production, value, exports., etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage harvested.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Chicago cash price per bushel, No. 2.				Domestic exports, including rye flour, fiscal year beginning July 1.
						December.		Following May.		
						Low.	High.	Low.	High.	
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*C'ts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*
1849	....	....	*14,189,000*	....	....	....	....	....	....	....
1859	....	....	*21,101,000*	....	....	....	....	....	....	....
1866	1,548,000	13.5	20,865,000	82.2	17,150,000	....	....	142	150	23[illegible],971
1867	1,689,000	13.7	*23,184,000*	100.4	23,281,000	132	157	173	185	564,901
1868	1,651,000	13.6	22,505,000	94.9	21,349,000	106½	118	100	115½	92,869
1869	1,658,000	13.6	22,528,000	77.0	17,342,000	66	77½	78	83½	199,450
1869	....	....	*16,919,000*	....	....	....	....	....	....	....
1870	1,176,000	13.2	15,474,000	73.2	11,327,000	67	74	81	91	87,174
1871	1,070,000	14.4	15,366,000	71.1	10,928,000	62	63¾	75	93	832,689
1872	1,049,000	14.2	14,889,000	67.6	10,071,000	57½	70	68½	70	611,749
1873	1,150,000	13.2	15,142,000	70.3	10,638,000	70	81	91	102	1,923,404
1874	1,117,000	13.4	14,991,000	77.4	11,610,000	93	99½	103	107½	267,058
1875	1,360,000	13.0	17,722,000	67.1	11,894,000	67	68¾	61½	70½	589,159
1876	1,468,000	13.9	20,375,000	61.4	12,505,000	65½	73	70	92½	2,234,856
1877	1,413,000	15.0	21,170,000	57.6	12,202,000	55½	56½	54	60	4,249,684
1878	1,623,000	15.9	25,843,000	52.5	13,566,000	41	44½	47	52	4,377,821
1879	1,625,000	14.5	23,639,000	65.6	15,507,000	73½	81	73½	85	2,943,894
1879	*1,842,000*	*10.8*	*19,832,000*	....	....	....	....	....	....	....
1880	1,768,000	13.9	24,541,000	75.6	18,565,000	82	91½	115	118	1,955,155
1881	1,789,000	11.6	20,705,000	93.3	19,327,000	96½	98	77	83	1,003,609
1882	2,228,000	13.4	29,960,000	61.5	18,439,000	57	58½	62	67	2,206,212
1883	2,315,000	12.1	28,059,000	58.1	16,301,000	56½	60	60½	62½	6,247,590
1884	2,344,000	12.2	28,640,000	51.9	14,857,000	51	52	68	73	2,974,390
1885	2,129,000	10.2	21,756,000	57.9	12,595,000	58½	61	58	61	216,699
1886	2,130,000	11.5	24,489,000	53.8	13,181,000	53	54½	54½	56½	377,302
1887	2,053,000	10.1	20,693,000	54.5	11,283,000	55½	61½	63	68	94,827
1888	2,365,000	12.0	28,415,000	58.8	16,722,000	50	52	39	71½	309,266
1889	2,171,000	13.1	28,420,000	42.3	12,010,000	44	45½	49½	54	2,280,975
1889	*2,172,000*	*13.1*	*28,421,000*	....	....	....	....	....	....	....
1890	2,142,000	12.0	25,807,000	62.9	16,230,000	64½	68½	83	92	358,263
1891	2,176,000	14.6	31,752,000	77.4	24,589,000	86	92	70¼	79	12,068,628
1892	2,164,000	12.9	27,979,000	51.2	15,160,000	46	51	50½	62	1,493,924
1893	2,038,000	13.0	26,555,000	51.3	13,612,000	45	47½	44½	48	249,152
1894	1,945,000	13.7	26,728,000	50.1	13,395,000	47½	49	62½	67	22,045

RYE—Continued.

TABLE 65.—*Rye: Acreage, production, value, exports, etc., in the United States, 1849–1920*—Continued.

Year.	Acreage harvested.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Chicago cash price per bushel, No. 2. December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, including rye flour, fiscal year beginning July 1.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*
1895	1,890,000	14.4	27,210,000	44.0	11,965,000	32	35¾	33	36½	1,011,128
1896	1,831,000	13.3	24,369,000	40.9	9,961,000	37	42½	32¾	35½	8,575,663
1897	1,704,000	16.1	27,363,000	44.7	12,240,000	45¾	47	48	75	15,562,035
1998	1,643,000	15.6	25,658,000	46.3	11,875,000	52½	55½	56½	62	10,169,822
1899	1,659,000	14.4	23,962,000	51.0	12,214,000	49	52	53	56¼	2,382,012
1899	*2,054,000*	*12.4*	*25,569,000*	...	...	...	...	...	...	...
1900	1,591,000	15.1	23,996,000	51.2	12,295,000	45¾	49¾	51½	54	2,345,512
1901	1,988,000	15.3	30,345,000	55.7	16,910,000	59	65¾	54½	58	2,712,077
1902	1,979,000	17.0	33,631,000	50.8	17,081,000	48	49¾	48	50½	5,445,273
1903	1,907,000	15.4	29,363,000	54.5	15,994,000	50½	52½	69¾	78	784,068
1904	1,793,000	15.2	27,242,000	68.8	18,748,000	73	75	70	84	29,749
1905	1,730,000	16.5	28,486,000	61.1	17,414,000	64	68	58	62	1,387,826
1906	2,002,000	16.7	33,375,000	58.9	19,671,000	61	65	69	87½	769,717
1907	1,926,000	16.4	31,566,000	73.1	23,068,000	75	82	79	86	2,444,588
1908	1,948,000	16.4	31,851,000	73.6	23,455,000	75	77¼	83	90	1,295,701
1909	2,006,000	16.1	32,239,000	...	...	...	...	...	...	...
1909	*2,196,000*	*13.4*	*29,520,000*	71.8	21,163,000	72	80	74	80	242,262
1910 [1]	2,185,000	16.0	34,897,000	71.5	24,953,000	80	82	90	113	40,123
1911	2,127,000	15.6	33,119,000	83.2	27,557,000	91	94	90	95½	31,384
1912	2,117,000	16.8	35,664,000	66.3	23,636,000	58	64	60	64	1,854,738
1913	2,557,000	16.2	41,381,000	63.4	26,220,000	61	65	62	67	2,272,492
1914	2,541,000	16.8	42,779,000	86.5	37,018,000	107½	112½	115	122	13,026,778
1915	3,129,000	17.3	54,050,000	83.4	45,083,000	94½	98½	96½	99½	15,250,151
1916	3,213,000	15.2	48,862,000	122.1	59,676,000	130	151	200	240	13,703,499
1917	4,317,000	14.6	62,933,000	166.0	104,447,000	176	184	180	260	17,186,417
1918	6,391,000	14.2	91,041,000	151.6	138,038,000	154	164	145½	173	36,467,450
1919	7,103,000	12.5	88,909,000	134.5	119,596,000	149	182	198	229	41,230,961
1920	5,043,000	13.7	69,318,000	127.8	88,609,000	144	167	...	...	...

[1] Figures adjusted to census basis.

TABLE 66.—*Rye: Revised acreage, production, and farm value, 1879 and 1889–1909.*

[See head note of Table 5.]

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1879	*1,842,000*	13.7	25,201,000	67.6	17,040,000
1889	*2,172,000*	13.1	28,378,000	42.3	11,991,000
1890	2,184,000	12.1	26,414,000	62.6	16,536,000
1891	2,234,000	14.7	32,761,000	77.1	25,264,000
1892	2,251,000	13.0	29,253,000	53.6	15,674,000
1893	2,178,000	13.1	28,592,000	50.2	14,360,000
1894	2,164,000	13.7	29,613,000	49.4	14,622,000
1895	2,153,000	14.5	31,139,000	42.2	13,151,000
1896	2,126,000	13.6	28,913,000	38.8	11,231,000
1897	2,077,000	16.1	33,433,000	43.2	14,454,000
1898	2,071,000	15.9	32,888,000	44.5	14,640,000
1899	*2,054,000*	14.8	30,334,000	49.6	15,046,000
1900	2,042,000	15.1	30,791,000	49.8	15,341,000
1901	2,033,000	15.3	31,103,000	55.4	17,220,000
1902	2,051,000	17.2	35,255,000	50.5	17,798,000
1903	2,074,000	15.4	31,990,000	54.0	17,272,000
1904	2,085,000	15.3	31,805,000	68.9	21,923,000
1905	2,141,000	16.4	35,167,000	60.4	21,241,000
1906	2,186,000	16.7	36,559,000	58.5	21,381,000
1907	2,167,000	16.4	35,455,000	72.5	25,709,000
1908	2,175,000	16.4	35,768,000	72.8	26,023,000
1909	*2,196,000*	16.1	35,406,000	72.2	25,548,000

RYE—Continued.

TABLE 67.—*Rye: Acreage (sown and harvested), production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.		Production.	Farm value, Dec. 1.	State.	Acreage.		Production.	Farm value, Dec. 1.
	Sown in fall of 1919.	Harvested.				Sown in fall of 1919.	Harvested.		
	Acres.	*Acres.*	*Bush.*	*Dolls.*		*Acres.*	*Acres.*	*Bush.*	*Dolls.*
Vermont	1	1	20	26	Missouri	51	50	600	750
Massachusetts	5	5	105	205	North Dakota	960	934	9,340	11,115
Connecticut	7	7	140	244	South Dakota	350	320	4,320	4,709
New York	112	107	1,872	2,958	Nebraska	278	264	3,722	3,834
New Jersey	67	66	1,155	1,964	Kansas	125	124	1,612	1,612
Pennsylvania	170	166	2,656	3,718	Kentucky	44	40	480	720
Delaware	4	4	60	82	Tennessee	33	30	300	570
Maryland	31	30	462	721	Alabama	4	4	44	110
Virginia	75	72	864	1,339	Texas	3	3	48	72
West Virginia	16	15	165	264	Oklahoma	26	25	375	375
North Carolina	98	96	912	1,733	Arkansas	4	4	40	88
South Carolina	24	24	264	792	Montana	90	80	880	950
Georgia	31	29	290	609	Wyoming	32	30	540	621
Ohio	85	80	1,152	1,555	Colorado	125	115	1,357	1,425
Indiana	325	310	4,340	5,642					
					Utah	16	15	124	186
Illinois	225	210	3,276	4,259	Idaho	19	18	252	252
Michigan	690	660	9,702	12,613	Washington	42	39	370	592
Wisconsin	483	483	7,728	10,046	Oregon	42	40	520	650
Minnesota	492	480	8,160	9,955					
Iowa	65	63	1,071	1,253	United States	5,250	5,043	69,318	88,609

TABLE 68.—*Rye: Acreage sown and harvested, United States, 1906–1920.*

Year.	Acreage sown in preceding fall.	Acreage harvested.	Year.	Acreage sown in preceding fall.	Acreage harvested.
	Acres.	*Acres.*		*Acres.*	*Acres.*
1906	2,100,000	2,002,000	1914	2,773,000	2,541,000
1907	2,061,000	1,926,000	1915	3,153,000	3,129,000
1908	2,015,000	1,948,000	1916	3,474,000	3,213,000
1909	2,326,000	2,196,000	1917	4,480,000	4,317,000
1910	2,413,000	2,185,000	1918	6,708,000	6,185,000
1911	2,415,000	2,127,000	1919	7,232,000	7,103,000
1912	2,478,000	2,117,000	1920	5,250,000	5,043,000
1913	2,731,000	2,557,000	1921	4,653,000	....

TABLE 69.—*Rye: Condition of crop, United States, on first of months named, 1900–1920.*

Year.	December of previous year.	April.	May.	June.	When harvested.	Year.	December of previous year.	April.	May.	June.	When harvested.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1900	98.2	84.8	88.5	87.6	80.4	1911	92.6	89.3	90.0	88.6	85.0
1901	99.1	93.1	94.6	93.9	93.0	1912	93.3	87.9	87.5	97.7	88.2
1902	89.9	85.4	83.4	88.1	90.2	1913	93.5	89.3	91.0	90.9	88.6
1903	98.1	97.9	93.3	90.6	89.5	1914	95.3	91.3	93.4	93.6	92.9
1904	92.7	82.3	81.2	86.3	88.9	1915	93.6	89.5	93.3	92.0	92.0
1905	90.5	92.1	93.5	94.0	93.2	1916	91.5	87.8	88.7	86.9	87.0
1906	95.4	90.9	92.9	89.9	91.3	1917	88.8	86.0	88.8	84.3	79.4
1907	96.2	92.0	88.0	88.1	89.7	1918	84.1	85.8	85.8	83.6	80.8
1908	91.4	89.1	90.3	91.3	91.2	1919	89.0	90.6	95.3	93.5	85.7
1909	87.6	87.2	88.1	89.6	91.4	1920	89.8	86.8	85.1	84.4	83.5
1910	94.1	92.3	91.3	90.6	87.5	1921	90.5	......	......	......	......

RYE—Continued.

TABLE 70.—*Rye: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911–1920.	1916	1917	1918	1919	1920	5-year average, 1915–1919.	1920
Vt	19.6	22.5	20.0	18.0	20.0	17.0	20.0	20.0	21.0	18.0	20.0	118	120	175	166	150	130	27.06	26.00
Mass	19.4	16.0	18.5	18.5	19.0	20.0	18.5	19.0	20.0	23.0	21.0	142	127	200	227	175	195	33.51	40.95
Conn	19.8	18.5	17.5	19.3	19.0	21.5	19.6	20.5	22.0	20.0	20.0	139	125	210	205	200	174	34.92	34.80
N. Y	17.4	16.7	16.5	17.2	17.7	18.7	18.0	19.0	16.5	16.1	17.5	121	128	184	172	150	158	25.58	27.65
N. J	18.0	16.4	17.5	18.0	18.5	20.0	19.0	18.5	18.5	16.0	17.5	121	117	175	173	160	170	26.12	29.75
Pa	16.9	15.1	17.5	17.5	18.0	18.0	17.0	17.0	17.0	16.0	16.0	114	109	170	165	157	140	23.14	22.40
Del	15.0	15.0	14.0	14.0	17.5	15.5	15.0	16.0	14.5	13.0	15.0	121	123	178	171	160	136	21.57	20.40
Md	15.4	14.5	15.5	14.4	17.0	16.5	15.5	16.0	15.0	14.0	15.4	118	110	168	170	163	156	21.35	24.02
Va	12.7	11.5	12.5	12.3	13.0	14.5	12.5	15.0	12.0	11.5	12.0	122	107	175	175	170	155	18.73	18.60
W. Va	13.3	11.0	13.0	13.5	14.5	14.0	16.0	13.5	13.7	13.0	11.0	124	119	169	180	165	160	20.20	17.60
N. C	9.8	10.0	9.3	10.3	10.0	11.5	9.7	10.0	8.0	8.9	9.5	144	130	200	198	210	190	16.24	18.05
S. C	10.4	10.0	9.5	10.5	11.5	10.0	9.8	10.0	11.2	10.0	11.0	210	185	285	295	295	300	24.85	33.00
Ga	9.2	9.5	9.2	9.5	9.3	9.2	9.5	8.3	8.8	8.9	10.0	182	160	270	210	272	210	18.64	21.00
Ohio	16.3	15.5	15.5	16.5	17.0	17.5	14.5	18.0	17.0	16.7	14.4	110	120	161	150	145	135	22.12	19.44
Ind	14.9	13.7	14.5	15.2	16.3	16.0	14.0	15.0	16.5	14.0	14.0	108	119	160	152	140	130	19.69	18.20
Ill	16.8	16.8	16.0	16.5	16.0	18.5	15.5	17.5	19.0	16.5	15.6	108	122	165	150	130	130	22.62	20.28
Mich	14.6	14.6	13.3	14.3	16.0	15.5	14.3	14.0	14.3	15.0	14.7	109	130	165	150	128	130	19.10	19.11
Wis	17.2	17.0	18.3	7.5	16.5	18.5	16.2	18.5	17.6	15.8	16.0	109	132	169	150	133	130	23.23	20.80
Minn	18.4	18.7	23.0	19.0	18.8	19.5	15.0	18.5	20.0	15.0	17.0	104	127	167	150	130	122	23.05	20.74
Iowa	18.0	18.0	19.0	18.2	19.0	18.5	17.0	18.0	19.0	15.9	17.0	102	115	155	147	132	117	22.23	19.89
Mo	13.5	14.1	14.8	15.0	14.0	13.5	11.0	14.7	14.0	12.0	12.0	114	123	165	163	150	125	18.04	15.00
N. Dak	13.2	16.6	18.0	14.4	17.1	15.0	13.3	9.5	10.5	8.0	10.0	100	125	164	145	121	119	13.79	11.90
S. Dak	15.8	10.0	19.5	13.2	17.0	19.5	18.0	16.0	18.0	13.0	13.5	98	118	155	141	125	109	20.50	14.72
Nebr	15.2	13.0	16.0	14.5	16.0	17.5	16.0	15.6	12.9	16.3	14.1	96	116	155	135	115	103	18.34	14.52
Kans	14.5	11.0	15.9	14.0	20.0	16.0	14.5	14.0	14.3	12.6	13.0	107	110	167	170	141	100	18.71	13.00
Ky	12.4	12.0	13.0	12.4	13.7	12.0	11.2	12.5	13.6	12.0	12.0	125	129	175	161	175	150	18.10	18.00
Tenn	10.8	11.9	11.5	12.0	13.0	10.5	10.0	9.8	10.0	9.0	10.0	141	135	195	192	200	190	16.13	19.00
Ala	10.9	10.0	11.5	11.0	13.0	10.0	13.0	9.5	11.0	9.5	10.9	186	175	268	261	260	250	23.02	27.25
Tex	13.2	10.0	16.6	15.0	14.8	17.0	10.0	10.0	5.4	17.0	16.0	139	120	196	235	167	150	18.04	24.00
Okla	12.0	9.5	12.0	9.5	16.0	13.5	10.0	10.0	11.0	14.0	15.0	118	125	170	187	150	100	16.29	15.00
Ark	10.6	10.0	10.5	11.5	10.5	10.5	10.0	13.5	10.5	9.5	10.0	139	115	150	210	200	220	16.66	22.00
Mont	17.1	23.0	23.5	21.0	21.0	22.5	20.5	12.7	12.0	4.0	11.0	102	96	165	144	185	108	15.99	11.88
Wyo	17.0	20.0	19.0	19.0	17.0	20.0	15.5	14.0	18.0	9.0	18.0	110	108	155	152	180	115	20.00	20.70
Colo	14.1	12.0	19.5	17.0	17.5	17.5	14.0	16.0	7.0	8.8	11.8	95	105	146	140	130	105	14.31	12.39
Utah	12.9	15.5	15.0	17.0	17.5	15.5	12.0	8.0	13.0	7.0	8.3	111	100	160	180	200	150	14.46	12.45
Idaho	18.2	22.5	22.0	22.0	20.0	20.0	17.0	15.5	15.0	14.0	14.0	99	95	135	165	175	100	19.98	14.00
Wash	16.0	22.0	20.0	21.0	19.7	18.2	14.5	12.7	10.0	12.0	9.5	120	111	175	200	185	160	18.83	15.20
Oreg	15.0	19.5	16.0	17.5	16.0	18.0	17.0	12.7	11.0	9.7	13.0	123	115	170	205	190	125	19.66	16.25
U.S.	15.3	15.6	16.8	16.2	16.8	17.3	15.2	14.6	14.2	12.5	13.7	108.5	122.1	166.0	151.6	134.5	127.8	19.12	17.57

[1] Based upon farm price Dec. 1.

TABLE 71.—*Rye: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	152.3	150.7	170.3	118.5	85.3	90.2	62.5	63.8	82.7	73.3	105.0
Feb. 1	154.5	140.4	174.8	123.5	88.3	100.6	61.7	68.9	84.4	73.1	107.0
Mar. 1	145.0	132.2	201.0	126.0	85.6	105.4	61.9	63.2	84.0	71.9	107.6
Apr. 1	156.1	145.8	235.1	135.6	83.6	100.4	63.0	62.9	85.1	75.4	114.3
May 1	183.1	155.5	221.1	164.1	83.7	101.9	62.9	62.4	84.6	75.8	119.5
June 1	183.9	143.7	187.6	183.0	83.8	98.1	64.4	64.1	86.1	77.9	117.3
July 1	189.0	138.6	169.9	177.1	83.3	93.7	63.1	63.2	83.6	76.9	113.8
Aug. 1	168.6	149.7	163.9	178.1	83.4	89.0	61.0	60.7	77.9	75.5	110.8
Sept. 1	168.9	138.3	159.3	161.9	99.7	85.5	75.4	63.0	70.8	76.9	110.0
Oct. 1	162.3	135.8	154.0	169.8	104.1	81.7	79.0	64.8	70.1	79.7	110.1
Nov. 1	142.1	129.8	152.6	168.8	115.3	85.7	80.1	63.2	68.8	83.1	109.0
Dec. 1	127.8	134.5	151.6	166.0	122.1	83.4	86.5	63.4	66.3	83.2	108.5
Average	155.3	138.7	167.4	156.5	99.7	89.2	72.8	63.8	74.9	78.1	109.6

RYE—Continued.

Table 72.—*Rye: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Philadelphia. No. 2, Western. Low.	Philadelphia. No. 2, Western. High.	Philadelphia. No. 2, Western. Average.	Cincinnati. No. 2. Low.	Cincinnati. No. 2. High.	Cincinnati. No. 2. Average.	Chicago. No. 2. Low.	Chicago. No. 2. High.	Chicago. No. 2. Average.	Duluth. No. 2. Low.	Duluth. No. 2. High.	Duluth. No. 2. Average.	San Francisco. Per 100 lbs. Low.	San Francisco. Per 100 lbs. High.	San Francisco. Per 100 lbs. Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June	65	70	.....	60	70	65.8	58	65½	62.5	52	59	55.6	132½	147½	140.0
July-December	65	77	.....	60	72	65.3	61	70½	61.9	50	65	56.4	135	165	145.0
1914.															
January-June	65	75	.....	62	71	65.7	58	67	62.8	50	62	56.3	152½	165	159.1
July-December	65	125	109.4	60	115	92.6	55	112½	89.2	57	107	86.6	130	165	154.2
1915.															
January-June	105	130	117.0	107	133	115.9	111½	131	118.9	106	128	114.2	160	225	186.6
July-December	90	112	.....	92	112	102.1	91	119	100.3	87	111	94.4	145	165	156.5
1916.															
January-June	90	118	.....	90	106	98.9	90	104¾	97.8	87	98	93.4	150	160	155.4
July-December	90	155	138.3	96	155	127.3	94	153	125.5	89	150	123.0	152½	265	197.6
1917.															
January-June	140	245	186.9	140	240	180.1	138	245	184.9	134	240	177.7	230	400	279.6
July-December	173	245	200.6	170	280	191.4	165	243	189.1	168	298	187.8	290	400	339.0
1918.															
January-June	175	188	180.4	175	280	218.9	160	295	228.6	182	300	246.5	390	425	409.7
July-December	165	176½	172.5	155	170	160.7	154	185	164.5	150	186	165.6	.....	(1)	.....
1919.															
January-June	148	176½	169.2	123	173	152.8	124	181½	155.7	128½	178½	151.6	.....	(1)	.....
July-December	115	165	146.0	136	177	150.8	133½	182	150.2	133¼	178¾	148.2	310	375	346.0
1920.															
January	179½	198	188.8	171	186	178.6	166	185¾	176.6	164⅝	183⅝	179.6	310	325	317.5
February	160	182	171.0	142	172	154.8	144	168¼	156.0	144⅝	167⅜	155.2	310	325	317.5
March	174	197	185.5	155	181	174.3	159½	183¾	172.5	158	179⅝	171.0	310	325	317.5
April	201	236	218.5	190	215	204.2	182¼	217	199.5	182¾	217½	198.3	310	325	317.5
May	211	239	225.0	200	229	218.4	198	229	216.1	194½	224	212.3	310	325	317.5
June	231	239	235.0	208	222	216.4	213	241	222.5	211	231½	218.2	310	325	317.5
January-June	160	239	204.0	142	229	191.1	144	241	190.5	144⅝	231½	189.1	310	325	317.5
July	189	247	218.0	215	227	220.0	171	235½	219.2	174¾	235	210.2	310	325	317.5
August	184	220	202.0	172	206	194.5	170	210	199.4	182¼	208¾	197.2	310	325	317.5
September	189	224	206.5	179	203	192.4	187¾	209½	196.5	171	200	188.0	310	325	317.5
October	181	198	189.5	166	175	170.4	160	177½	170.2	162½	179	169.9	310	325	317.5
November	160	180	170.0	150	176	165.2	141½	173	156.5	132	163½	148.4	310	325	317.5
December	162	183	172.5	145	162	153.8	144	167	157.2	139	154¾	147.1	310	325	317.5
July-December	160	247	193.1	145	227	182.7	141½	235½	183.2	132	235	176.8	310	325	317.5

[1] Nominal.

RYE—Continued.

TABLE 73.—*Rye (including flour): International trade, calendar years 1911–1919.*[1]

[See "General note," Table 15.]

EXPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
	1,000 bushels.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
From—							
Argentina	443	451	194	129	(2)	2	160
Belgium	914						1
Bulgaria	2,336						
Canada	69	146	501	989	833	798	1,897
Denmark	303	349	371	385	555	641	
Germany	44,951						
Netherlands	18,870	10,418	26	14	(2)	(2)	483
Roumania	3,411	1,241					
Russia	34,921	20,298	13,331	12,315			
United States	855	8,158	13,655	15,838	14,689	16,308	40,494
Other countries	514	104	82	64	1,425	252	
Total	107,587	41,165	28,160	29,734	17,502	18,001	

IMPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	1,224						
Belgium	6,157						548
Denmark	8,587	5,701	2,757	2,350	443	41	
Finland	15,472	9,898	13,425	12,639			
France	4,138	1,441	36	14	21	1,346	665
Germany	16,900						
Italy	721	378	4	1	1,440	3,506	379
Netherlands	31,023	17,539	2,232	1,156	356	751	1,906
Norway	10,520	8,128	7,885	7,329	5,095	3,095	
Russia	5,231	5,453	1				
Sweden	3,769	2,586	1,986	1,168	461	138	3
Switzerland	729	267	16	42	198	452	1,632
United Kingdom	2,195	2,073	1,436	2,054	5,353	5,300	
Other countries	677	546	77	29	103	301	
Total	107,343	54,010	29,855	26,782	13,470	14,930	

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.
[2] Less than 500 bushels.

BUCKWHEAT.

TABLE 74.—*Buckwheat: Acreage, production, and value in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage (thousands of acres).	Average yield per acre (bushels).	Production (thousands of bushels).	Average farm price Dec. 1 (cents per bushel).	Farm value Dec. 1 (thousands of dollars).	Domestic exports, year beginning July 1 (bushels).
1849	......	......	*8,957*	......	......	
1859	......	......	*17,572*	......	......	
1866	1,046	21.8	22,792	67.6	15,413	
1867	1,228	17.4	21,359	78.7	16,812	
1868	1,114	17.8	19,864	78.0	15,490	
1869	1,029	16.9	17,431	71.9	12,535	
1869	......	......	*9,822*	......	......	
1870	537	18.3	9,842	70.5	6,937	
1871	414	20.1	8,329	74.5	6,208	
1872	448	18.1	8,134	73.5	5,979	
1873	454	17.3	7,838	75.0	5,879	
1874	453	17.7	8,017	72.9	5,844	
1875	576	17.5	10,082	62.0	6,255	
1876	666	14.5	9,669	66.6	6,436	
1877	650	15.7	10,177	66.9	6,808	
1878	673	18.2	12,247	52.6	6,441	
1879	640	20.5	13,140	59.8	7,856	
1879	*848*	*13.9*	*11,817*	......	......	
1880	823	17.8	14,618	59.4	8,682	
1881	829	11.4	9,486	86.5	8,206	
1882	847	13.0	11,019	73.0	8,039	
1883	857	8.9	7,669	82.2	6,304	
1884	879	12.6	11,116	58.9	6,549	
1885	914	13.8	12,626	55.9	7,057	
1886	918	12.9	11,869	54.5	6,465	
1887	911	11.9	10,844	56.5	6,122	
1888	913	13.2	12,050	63.3	7,628	
1889	837	14.5	12,110	50.5	6,113	
1889	*837*	*14.5*	*12,110*	......	......	
1890	845	14.7	12,433	57.2	7,110	
1891	849	15.0	12,761	57.0	7,272	
1892	861	14.1	12,143	51.8	6,296	....
1893	816	14.9	12,132	58.3	7,074	....
1894	789	16.1	12,668	55.6	7,040	....
1895	763	20.1	15,341	45.2	6,936	....
1896	755	18.7	14,090	39.2	5,522	1,677,102
1897	718	20.9	14,997	42.1	6,319	1,370,403
1898	678	17.3	11,722	45.0	5,271	1,533,980
1899	670	16.6	11,094	55.7	6,184	426,822
1899	*807*	*13.9*	*11,234*	......	......	....
1900	638	15.0	9,567	55.8	5,341	123,540
1901	811	18.6	15,126	56.3	8,523	719,615
1902	805	18.1	14,530	59.6	8,655	117,953
1903	804	17.7	14,244	60.7	8,651	31,006
1904	794	18.9	15,008	62.2	9,331	316,399
1905	760	19.2	14,585	58.7	8,565	696,513
1906	789	18.6	14,642	59.6	8,727	199,429
1907	800	17.9	14,290	69.8	9,975	116,127
1908	803	19.8	15,874	75.6	12,004	186,702
1909	834	20.9	17,438	......	......	....
1909	*878*	*16.9*	*14,849*	70.1	10,346	158,160
1910[1]	860	20.5	17,598	66.1	11,636	223
1911	833	21.1	17,549	72.6	12,735	180
1912	841	22.9	19,249	66.1	12,720	1,347
1913	805	17.2	13,833	75.5	10,445	580
1914	792	21.3	16,881	76.4	12,892	413,643
1915	769	19.6	15,056	78.7	11,843	515,304
1916	828	14.1	11,662	112.7	13,147	260,102
1917	924	17.3	16,022	160.0	25,631	5,567
1918	1,027	16.5	16,905	166.5	28,142	119,516
1919	739	20.6	15,244	146.9	22,397	244,785
1920	729	18.9	13,789	129.1	17,797	....

[1] Figures adjusted to census basis.

BUCKWHEAT—Continued.

TABLE 75.—*Buckwheat: Revised acreage, production, and farm value, 1879 and 1889–1909.*

[See headnote of Table 5.]

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*		*Acres.*	*Bush.*	*Bushels.*	*Cents.*	*Dollars.*
1879..	*848,000*	20.7	17,530,000	60.3	10,575,000	1900.	795,000	14.9	11,810,000	55.8	6,588,000
1889..	*837,000*	14.5	12,109,000	50.5	6,115,000	1901.	852,000	18.4	15,6693,00	56.4	8,857,000
1890..	863,000	14.7	12,678,000	57.3	7,264,000	1902.	856,000	17.9	15,2286,00	59.6	9,110,000
1891..	867,000	15.0	13,013,000	57.0	7,422,000	1903.	870,000	17.5	15,248,000	60.8	9,277,000
1892..	899,000	14.1	12,643,000	52.0	6,573,000	1904.	876,000	18.6	16,327,000	62.5	10,208,000
1893..	87,3000	14.7	12,866,000	58.3	7.503,000	1905.	840,000	18.8	15,797,000	58.6	9,261,000
1894..	864,000	15.9	13,721,000	55.7	7,638,000	1906.	865,000	18.2	15,734,000	59.7	9,386,000
1895..	842,000	19.9	16,748,000	45.3	7,583,000						
						1907.	838,000	17.7	14,858,000	70.0	10,397,000
1896..	853,000	18.5	15,805,000	39.3	6,211,000	1908.	853,000	19.4	16,541,000	75.7	12,518,000
1897..	838,000	20.6	17,260,000	42.1	7,259,000	1909.	*878,000*	20.5	17,983,000	70.2	12,628,000
1898..	811,000	17.2	13,961,000	45.0	6,278,000						
1899..	*807,000*	16.1	13,001,000	55.9	7,263,000						

TABLE 76.—*Buckwheat: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Dollars.*		*Acres.*	*Bushels.*	*Dollars.*
Maine	10	270	413	Ohio	26	543	570
New Hampshire	1	20	24	Indiana	10	200	240
Vermont	6	132	178	Illinois	4	72	98
Massachusetts	2	38	53	Michigan	42	609	664
Connecticut	5	85	136	Wisconsin	27	432	518
New York	221	4,420	6,188	Minnesota	15	300	318
New Jersey	10	180	270	Iowa	8	136	182
Pennsylvania	232	4,176	5,011	Missouri	6	96	149
Delaware	7	126	151	Nebraska	1	16	16
Maryland	15	300	399	Tennessee	6	108	140
Virginia	25	540	756				
West Virginia	40	780	1,092	United States..	729	13,789	17,797
North Carolina	10	210	231				

TABLE 77.—*Buckwheat: Condition of crop, United States, on first of months named, 1900–1920.*

Year.	Aug.	Sept.	When harvested.	Year.	Aug.	Sept.	When harvested.	Year.	Aug.	Sept.	When harvested.
	P. ct.	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*
1900	87.9	80.5	72.8	1907	91.9	77.4	80.1	1914	88.8	87.1	83.3
1901	91.1	90.9	90.5	1908	89.4	87.8	81.6	1915	92.6	88.6	81.9
1902	91.4	86.4	80.5	1909	86.4	81.0	79.5	1916	87.8	78.5	66.9
1903	93.9	91.0	83.0	1910	87.9	82.3	81.7	1917	92.2	90.2	74.8
1904	92.8	91.5	88.7	1911	82.9	83.8	81.4	1918	88.6	83.3	75.6
1905	92.6	91.8	91.6	1912	88.4	91.6	89.2	1919	88.1	90.1	88.0
1906	93.2	91.2	81.9	1913	85.5	75.4	65.9	1920	90.5	91.1	85.6

BUCKWHEAT—Continued.

TABLE 78.—*Buckwheat: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911-1920.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	10-year average, 1911-1920.	1916.	1917.	1918.	1919.	1920.	5-year average, 1915-1919.	1920.
Me.	26.3	30.0	29.4	32.0	29.0	26.0	24.0	21.5	20.0	24.0	27.0	105	95	150	150	175	153	29.05	41.31
N. H.	23.5	27.3	31.0	31.0	25.0	30.0	20.0	16.0	17.0	18.0	20.0	113	100	183	200	156	122	27.13	24.40
Vt.	23.8	24.3	30.0	25.0	28.0	27.0	17.5	20.0	21.9	23.0	22.0	112	105	150	160	170	135	28.64	29.70
Mass.	18.2	21.0	21.0	17.0	18.5	16.0	16.0	15.0	16.0	22.0	19.0	124	140	166	196	160	140	25.81	26.60
Conn.	18.7	19.0	20.5	17.0	18.5	20.0	19.0	17.3	19.0	20.0	17.0	136	120	200	210	200	160	31.30	27.20
N. Y.	18.8	21.3	23.8	14.3	23.0	19.0	12.0	18.0	15.0	22.0	20.0	112	122	160	175	145	140	23.36	28.00
N. J.	19.7	20.0	22.0	22.0	21.0	21.0	19.0	18.0	18.0	18.0	18.0	112	108	158	170	150	150	24.80	27.00
Pa.	19.6	21.9	24.2	18.5	20.5	21.0	14.0	18.0	18.0	21.6	18.0	105	111	163	160	140	120	24.06	21.60
Del.	18.5	19.0	16.0	17.0	19.0	18.5	19.0	20.0	20.5	18.0	18.0	104	118	148	143	160	120	24.80	21.60
Md.	19.6	20.0	17.5	16.5	18.5	20.0	19.0	21.0	20.0	23.0	20.0	109	110	165	165	155	133	27.72	26.60
Va.	20.2	16.0	21.5	23.1	19.4	20.0	19.2	21.1	21.0	19.0	21.6	109	95	150	163	155	140	25.91	30.24
W. Va.	21.1	24.0	24.0	21.0	21.5	22.0	18.3	20.0	19.5	21.0	19.5	116	101	170	173	170	140	27.90	27.30
N. C.	19.0	19.0	17.5	19.3	19.0	17.5	17.5	20.0	20.0	19.0	21.0	102	85	130	150	140	110	22.37	23.10
Ohio.	20.1	21.0	19.5	18.0	24.0	23.0	17.7	17.2	16.0	23.4	20.9	106	110	153	156	155	105	24.95	21.94
Ind.	17.2	18.3	19.0	18.5	17.5	14.0	18.0	15.0	15.0	16.5	20.0	108	112	155	160	150	120	20.67	24.00
Ill.	18.2	18.1	22.0	17.0	17.7	17.0	17.0	19.0	17.8	18.0	18.0	124	130	170	180	180	136	26.83	24.48
Mich.	14.1	18.0	17.0	15.0	18.5	14.5	11.0	9.0	10.0	13.8	14.5	103	115	147	170	137	109	14.45	15.80
Wis.	15.6	17.5	17.0	16.5	17.5	13.0	14.0	12.2	15.9	16.2	16.0	109	116	174	165	150	120	19.76	19.20
Minn.	17.5	18.0	21.0	16.5	17.0	17.5	15.0	14.0	17.0	19.0	20.0	100	112	135	170	130	106	20.48	21.20
Iowa.	15.5	17.5	19.0	14.0	18.3	13.0	15.0	12.0	15.0	14.0	17.0	121	125	200	180	169	134	20.76	22.78
Mo.	14.0	10.0	15.0	11.0	15.5	15.0	14.0	15.0	13.0	15.0	16.0	126	133	144	180	184	155	20.94	24.80
Nebr.	17.2	16.0	18.0	20.0	18.5	20.0	17.0	16.0	14.0	16.0	16.0	115	110	150	165	180	100	22.72	16.00
Tenn.	17.8	16.0	18.0	15.0	22.3	18.0	18.0	17.0	18.0	18.0	18.0	106	100	150	140	150	130	21.88	23.40
U. S.	19.0	21.1	22.9	17.2	21.3	19.6	14.1	17.3	16.5	20.6	18.9	108.4	112.7	160.0	166.5	146.9	129.1	23.35	24.41

[1] Based upon farm price Dec. 1.

TABLE 79.—*Buckwheat: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	150.7	162.9	162.7	117.2	81.5	77.9	76.6	66.8	73.7	65.8	103.6
Feb. 1	154.9	158.1	161.9	114.6	80.7	83.7	75.6	69.4	73.6	64.4	103.7
Mar. 1	155.7	148.4	168.2	124.8	83.2	85.5	75.1	67.0	76.9	64.1	104.9
Apr. 1	163.1	149.6	170.1	128.3	83.1	85.3	76.9	68.3	76.9	65.3	106.7
May 1	168.8	147.3	176.0	150.6	84.9	84.6	77.3	71.4	79.9	65.8	110.7
June 1	180.2	165.6	191.0	183.7	87.0	86.9	79.0	70.8	84.8	70.1	119.9
July 1	202.7	160.8	200.8	209.2	93.1	92.1	85.5	72.9	86.2	72.4	127.6
Aug. 1	181.3	165.9	192.7	189.3	89.0	89.2	81.2	72.4	83.6	76.0	122.1
Sept. 1	176.3	159.8	190.3	164.3	86.4	81.4	79.8	70.0	76.6	74.0	115.9
Oct. 1	159.4	162.0	180.0	154.4	90.4	73.7	78.7	74.1	69.7	69.6	111.2
Nov. 1	131.0	151.0	173.0	154.2	102.9	78.5	78.0	75.5	65.5	73.0	108.3
Dec. 1	129.1	146.9	166.5	160.0	112.7	78.7	76.4	75.5	66.1	72.6	108.4
Average	152.2	154.8	174.7	153.2	94.7	81.0	77.9	72.4	72.6	70.3	110.4

FLAX.

TABLE 80.—*Flax: Area and production in undermentioned countries, 1909–1919.*

Country.	Area.				Production.							
					Seed.				Fiber.			
	Average,[1] 1909–1913.	1917	1918	1919	Average,[1] 1909–1913.	1917	1918	1919	Average,[1] 1909–1913.	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
United States	2,490	1,984	1,910	1,572	19,505	9,164	13,369	7,661	......	......	......	......
Canada:												
Quebec	1	6	7	11	11	47	83	111	......	......	......	......
Ontario	8	4	16	14	128	52	196	130	......	......	......	......
Manitoba	58	16	108	57	706	147	1,091	520	......	......	......	......
Saskatchewan	893	754	841	930	10,393	4,710	4,205	4,490	......	......	......	......
Alberta	76	140	96	81	830	979	480	222	......	......	......	......
Total Canada	1,036	920	1,068	1,093	12,068	5,935	6,055	5,473	......	......	......	......
Mexico	......	......	......	......	150	......	......	......	......	......	......	......
Total	3,526	2,904	2,978	2,665	31,723	15,099	19,424	13,134	......	......	......	......
SOUTH AMERICA.												
Argentina	3,683	3,207	3,229	3,419	31,989	4,032	19,588	30,775	......	......	......	......
Uruguay	106	36	30	51	793	122	333	498	......	......	......	......
Total	3,789	3,243	3,259	3,470	32,782	4,154	19,921	31,273	......	......	......	......
EUROPE.												
Austria	[2] 97	14	13	......	[2] 694	45	35	......	[2] 53,096	......	......	......
Hungary [2]	24	......	......	......	196	......	......	......	20,548	......	......	......
Croatia-Slavonia [2]	17	......	......	......	21	......	......	......	8,046	......	......	......
Bosnia-Herzegovina [2]	......	......	......	......	4	......	......	......	1,080	......	......	......
Belgium	50	......	......	48	443	......	......	407	46,487	......	......	29,982
Bulgaria [2]	1	......	1	......	7	......	......	......	524	......	......	......
Czecho-Slovakia	......	......	......	[3] 37	......	......	......	[3] 218	......	......	......	......
France [1]	61	20	28	[4] 38	533	158	188	[4] 347	40,623	10,060	15,110	[4] 35,298
Ireland	53	108	143	96	......	......	......	......	23,701	34,410	35,175	30,734
Italy	22	20	21	17	320	323	472	433	6,289	5,291	5,291	2,425
Netherlands	33	30	14	24	374	222	145	......	17,276	11,756	6,559	11,323
Roumania [2]	52	......	[5] 186	[6] 48	503	......	[6] 292	[7] 305	4,864	......	[5] 4,453	[7] 2,293
Russia proper [2]	3,217	......	......	......	19,772	......	......	......	1,022	......	......	......
Poland [2]	88	......	......	......	874	......	......	......	42,450	......	......	......
Northern Caucasia [2]	104	......	......	......	679	......	......	......	26,130	......	......	......
Serbia [2]	4	......	......	......	......	......	......	......	1,812	......	......	......
Spain	......	4	4	2	......	22	65	42	......	......	6,768	970
Sweden	4	......	5	......	15	......	......	......	1,208	......	......	......
Total	3,827	......	......	......	24,435	......	......	......	295,156	......	......	......
ASIA.												
British India [8]	3,821	3,564	3,797	1,989	19,773	21,040	20,600	9,250	......	......	......	......
Japan	12	48	85	......	......	......	......	......	30,187	101,435	143,027	......
Russia:												
Central Asia (4 governments)	120	......	......	......	510	......	......	......	51,864	......	......	......
Siberia (4 governments)	147	......	......	......	852	......	......	......	38,109	......	......	......
Transcaucasia (1 government)	18	......	......	......	94	......	......	......	6,429	......	......	......
Total	4,118	......	......	......	21,229	......	......	......	126,589	......	......	......
AFRICA.												
Algeria	1	1	......	1	11	......	......	7	......	......	......	......
Grand total	15,261	......	......	......	110,180	......	......	......	421,745	......	......	......

[1] 5-year average except in a few cases where 5-year statistics were unavailable.
[2] Old boundaries.
[3] Bohemia and Moravia.
[4] Does not include Alsace-Lorraine.
[5] Includes Bessarabia; excludes Dobrudja.
[6] Former Kingdom and Bessarabia.
[7] Former Kingdom, Bessarabia and Bukowina.
[8] Includes some native States.

FLAX—Continued.

TABLE 81.—*Flax (seed and fiber): World production so far as reported.*

Year.	Production.		Year.	Production.	
	Seed.	Fiber.		Seed.	Fiber.
	Bushels.	*Pounds.*		*Bushels.*	*Pounds.*
1896	82,684,000	1,714,205,000	1906	88,165,000	1,871,723,000
1897	57,596,000	1,498,054,000	1907	102,960,000	2,042,390,000
1898	72,938,000	1,780,693,000	1908	100,850,000	1,907,591,000
1899	66,348,000	1,138,763,000	1909	100,820,000	1,384,524,000
1900	62,432,000	1,315,931,000	1910	85,253,000	913,112,000
1901	72,314,000	1,050,260,000	1911	101,339,000	1,011,350,000
1902	83,891,000	1,564,840,000	1912	130,291,000	1,429,967,000
1903	110,455,000	1,492,383,000	1913	132,477,000	1,384,757,000
1904	107,743,000	1,517,922,000	1914	94,559,000	1,044,746,000
1905	100,458,000	1,494,229,000	1915	103,287,000	975,685,000

TABLE 82.—*Flaxseed: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Domestic exports, fiscal year beginning July 1.	Imports, fiscal year beginning July 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*	*Bushels.*	*Bushels.*
1849			*562,000*			2,501	667,369
1859			*567,000*			2,715	[1] 3,000,000
1869			*1,730,000*			35	[1] 5,000,000
1879			*7,171,000*				1,464,195
1889	*1,319,000*	*7.8*	*10,250,000*			14,678	2,391,175
1899	*2,111,000*	*9.5*	*19,979,000*			2,830,991	67,379
1902	3,740,000	7.8	29,285,000	105.2	30,815,000	4,128,130	129,089
1903	3,233,000	8.4	27,301,000	81.7	22,292,000	758,379	213,270
1904	2,264,000	10.3	23,401,000	99.3	23,229,000	1,338	296,184
1905	2,535,000	11.2	28,478,000	84.4	24,049,000	5,988,519	52,240
1906	2,506,000	10.2	25,576,000	101.3	25,899,000	6,336,310	90,356
1907	2,864,000	9.0	25,851,000	95.6	24,713,000	4,277,313	57,419
1908	2,679,000	9.6	25,805,000	118.4	30,577,000	882,899	593,668
1909	2,742,000	9.4	25,856,000				
1909	*2,083,000*	*9.4*	*19,513,000*	153.0	29,796,000	65,193	5,002,496
1910 [2]	2,467,000	5.2	12,718,000	231.7	29,472,000	976	10,499,227
1911	2,757,000	7.0	19,370,000	182.1	35,272,000	4,323	6,841,806
1912	2,851,000	9.8	28,073,000	114.7	32,202,000	16,894	5,294,296
1913	2,291,000	7.8	17,853,000	119.9	21,399,000	305,546	8,653,235
1914	1,645,000	8.4	13,749,000	126.0	17,318,000	4,145	10,666,215
1915	1,387,000	10.1	14,030,000	174.0	24,410,000	2,614	14,679,233
1916	1,474,000	9.7	14,296,000	248.6	35,541,000	1,017	12,393,988
1917	1,984,000	4.6	9,164,000	296.6	27,182,000	21,481	13,366,529
1918	1,910,000	7.0	13,369,000	340.1	45,470,000	15,574	8,426,886
1919	1,572,000	4.9	7,661,000	438.3	33,581,000	24,044	23,391,934
1920	1,785,000	6.2	10,990,000	176.6	19,413,000		

[1] Approximate.

[2] Figures adjusted to census basis.

FLAX—Continued.

TABLE 83.—*Flaxseed: Condition of crop, United States, on first of months named, 1903–1920.*

Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1903	86.2	80.3	80.5	74.0	1912	88.9	87.5	86.3	83.8
1904	86.6	78.9	85.8	87.0	1913	82.0	77.4	74.9	74.7
1905	92.7	96.7	94.2	91.5	1914	90.5	82.1	72.9	77.4
1906	93.2	92.2	89.0	87.4	1915	88.5	91.2	87.6	84.5
1907	91.2	91.9	85.4	78.0	1916	90.3	84.0	84.8	86.2
1908	92.5	86.1	82.5	81.2	1917	84.0	60.6	50.2	51.3
1909	95.1	92.7	88.9	84.9	1918	79.8	70.6	72.6	70.8
1910	65.0	51.7	48.3	47.2	1919	73.5	52.7	50.5	52.6
1911	80.9	71.9	68.4	69.6	1920	89.1	80.1	63.8	62.8

TABLE 84.—*Flaxseed: Acreage, production, and total farm value, by States, 1920.*

State.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
Wisconsin	9,000	11.0	99,000	212	210,000
Minnesota	320,000	9.5	3,040,000	183	5,563,000
Iowa	12,000	10.0	120,000	180	216,000
Missouri	6,000	7.5	45,000	200	90,000
North Dakota	735,000	5.3	3,896,000	178	6,935,000
South Dakota	220,000	10.0	2,200,000	165	3,630,000
Nebraska	5,000	9.0	45,000	155	70,000
Kansas	23,000	6.9	159,000	180	286,000
Montana	451,000	3.0	1,353,000	175	2,368,000
Wyoming	4,000	8.2	33,000	135	45,000
United States	1,785,000	6.2	10,990,000	176.6	19,413,000

TABLE 85.—*Flaxseed: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911–1920.	1916	1917	1918	1919	1920	5-year average, 1915–1919.	1920
Wis	12.2	12.0	12.5	14.0	13.5	13.5	12.0	....	11.0	10.5	11.0	217	240	.....	330	430	212	33.64	23.32
Minn	9.3	8.0	10.2	9.9	9.3	10.5	8.5	9.5	10.4	8.5	9.5	223	240	295	341	445	183	28.01	17.38
Iowa	9.9	8.0	11.5	9.4	9.5	9.0	10.0	11.0	11.0	9.5	10.0	211	215	275	320	420	180	28.07	18.00
Mo	7.0	3.0	6.0	5.0	8.0	8.0	7.0	8.5	8.0	9.5	7.5	209	212	275	300	448	200	23.12	15.00
N. Dak	7.5	7.6	9.7	7.2	8.3	9.9	10.3	3.9	7.8	4.6	5.3	224	252	300	345	411	178	20.50	9.43
S. Dak	8.3	5.3	8.6	7.2	7.5	11.0	9.3	7.0	9.5	8.0	10.0	216	247	299	325	425	165	25.43	16.50
Nebr	7.6	5.0	9.5	6.0	7.0	11.0	8.0	5.5	9.5	5.0	9.0	205	230	250	330	400	155	19.93	13.95
Kans	5.8	3.0	6.0	6.0	6.0	5.7	5.8	7.0	5.0	6.3	6.9	212	234	290	330	380	180	16.51	12.42
Mont	6.7	7.7	12.0	9.0	8.0	10.5	9.5	3.0	3.0	1.5	3.0	219	248	295	338	440	175	13.40	5.25
Wyo	8.5	....	12.0	9.9	7.0	13.0	7.0	6.5	9.0	4.0	8.2	240	225	261	325	350	135	18.96	11.07
U. S.	7.6	7.0	9.8	7.8	8.4	10.1	9.7	4.6	7.0	4.9	6.2	221.7	248.6	296.6	340.1	438.3	176.6	20.12	10.88

[1] Based upon farm price Dec. 1.

FLAX—Continued.

TABLE 86.—*Flaxseed: Farm price, cents per bushel on first of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	433.6	327.7	310.8	250.7	185.9	134.8	124.2	106.2	187.1	221.1	228.2
Feb. 1	456.5	310.1	326.7	253.7	210.9	162.7	127.8	109.3	190.8	233.9	238.3
Mar. 1	472.7	327.4	349.8	253.1	202.5	157.9	132.5	119.0	183.9	240.7	244.0
Apr. 1	455.7	348.7	379.7	266.1	202.1	167.7	132.8	113.6	191.3	234.6	249.2
May 1	448.2	361.4	373.3	300.6	191.8	169.6	134.7	114.3	181.0	241.9	251.7
June 1	421.1	389.3	363.6	298.8	176.5	169.5	136.8	115.8	205.0	225.0	250.1
July 1	359.6	444.1	349.3	278.0	163.2	152.5	136.0	113.4	198.4	205.6	240.0
Aug. 1	303.7	540.6	410.5	271.6	178.1	144.6	150.7	118.6	175.2	199.2	249.3
Sept. 1	290.3	517.5	381.2	302.8	190.2	143.5	139.3	127.8	162.6	203.6	245.9
Oct. 1	279.7	438.2	380.9	308.5	199.2	148.1	127.4	122.6	147.7	205.0	235.7
Nov. 1	240.1	382.3	333.8	295.9	234.7	162.9	118.7	118.7	133.4	210.6	223.1
Dec. 1	176.6	438.3	340.1	296.6	248.6	174.0	126.0	119.9	114.7	182.1	221.7
Average	289.2	398.5	345.5	288.7	218.4	159.5	125.6	117.7	148.6	207.8	230.0

TABLE 87.—*Flaxseed: Monthly marketings by farmers, 1914–1919.*

Month.	Estimated amount sold monthly by farmers of United States (millions of bushels).						Per cent of year's sale.					
	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15
July	0.3	0.2	0.1	0.2	0.2	0.2	3.6	1.8	1.8	1.2	1.5	1.5
August	.6	.4	.3	.3	.2	.2	8.0	2.[illegible]	3.6	2.2	1.6	1.4
September	1.7	1.8	1.6	1.7	1.3	2.2	20.6	14.8	21.5	12.7	10.1	16.6
October	1.8	2.7	2.1	4.7	3.8	4.1	22.2	21.5	28.1	35.6	28.3	31.9
November	.9	1.9	1.3	3.2	3.6	3.2	11.1	15.0	17.6	24.3	27.0	24.7
December	.6	1.4	.6	1.5	1.6	1.2	7.4	10.9	7.6	11.4	11.9	9.3
January	.4	.6	.3	.6	.6	.5	5.0	5.2	4.7	4.4	4.6	3.6
February	.5	.6	.3	.2	.7	.4	6.3	4.4	4.0	1.7	5.1	3.2
March	.2	.7	.4	.3	.4	.4	3.1	5.8	4.8	2.0	3.3	3.0
April	.2	.5	.1	.1	.2	.2	3.1	4.3	1.8	.9	1.6	1.6
May	.2	.6	.1	.2	.2	.1	2.6	5.0	1.6	1.6	1.6	1.2
June	.6	1.0	.2	.3	.5	.3	7.0	8.4	2.9	2.0	3.4	2.0
Season	8.0	12.4	7.4	13.3	13.3	13.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 88.—*Flaxseed: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost and freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	38.0	0.7	0.1	0.5	2.0	4.1	(1)	45.5	3.7	10.6	0.1	(1)	60.2
1918	26.2	.2	.1	3.3	2.3	2.5	0.2	34.8	1.0	2.6	(1)	.1	39.3
1917	51.3	.3	(1)	2.9	1.2	2.9	(1)	59.3	1.2	1.2	(1)	.1	62.3
1916	3.3	2.3	.3	1.4	1.7	2.8	.3	12.4	3.9	.1	(1)	.1	17.2
1915	2.1	2.0	.3	8.5	2.1	.4	.2	16.1	2.6	.1	(1)	(1)	20.0
1914	11.4	1.7	.2	2.0	1.9	6.6	.3	24.1	2.2	.5	.2	.4	29.1
1913	24.3	.7	.1	1.0	1.7	2.2	.2	30.6	1.6	.2	......	.4	34.5
1912	5.1	2.9	.2	5.9	2.8	1.1	.8	19.0	3.7	.4	.4	1.4	26.6
1911	16.4	1.1	......	8.4	.9	2.8	.1	30.5	2.2	1.7	(1)	.2	36.3
1910	49.4	(1)	......	2.5	.9	6.2	.1	59.3	1.3	1.7	(1)	.1	63.1
1909	......	......	......	......	......	......	......	......	......	......	......	......	......
Average	21.1	1.3	.1	4.0	1.7	3.0	.2	31.8	2.2	.9	.1	.3	36.4

[1] Less than 0.05 per cent.

TABLE 89.—*Flaxseed: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Cincinnati.			Minneapolis.			Milwaukee. No. 1 Northwestern.			Duluth.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.												
January–June	$1.50	$1.50	$1.50	$1.23⅛	$1.40	....	$1.25½	$1.42¾	$1.31	$1.22⅝	$1.39	$1.30
July–December	1.50	1.50	1.50	1.31¼	1.53¼	....	1.30¾	1.54½	1.41	1.34⅜	1.53⅛	1.42
1914.												
January–June	1.50	1.50	1.50	1.47¼	1.61¼	$1.55	1.45¼	1.75	1.57	1.48	1.63¼	1.56
July–December	1.40	1.50	1.41	1.28	1.88	1.52	1.30	1.93	1.56	1.28¾	1.93	1.53
1915.												
January–June	1.70	1.80	....	1.59½	2.08½	1.87	1.51½	2.05	1.86	1.61½	2.09	1.89
July–December	1.70	1.70	....	1.52½	2.21	1.82	1.52½	2.18	1.81	1.53	2.20½	1.82
1916.												
January–June	2.85	2.85	2.85	1.73½	2.41¼	2.14	1.73½	2.38	2.11	1.76	2.43⅜	2.12
July–December	1.50	2.85	2.05	1.60	2.94	2.38	1.77	2.89	2.37	1.80	2.94½	2.41
1917.												
January–June	2.25	3.25	2.62	2.22	3.61	3.03	2.75	3.55	3.00	2.78	3.64	3.04
July–December	3.25	4.25	3.52	2.64	3.76	3.29	2.68	3.71	3.26	2.69	3.79	3.28
1918.												
January–June	3.75	4.25	3.83	3.46	4.34	3.96	3.50	4.32	3.88	3.46	4.36	3.91
July–December	3.25	4.75	3.91	3.31	4.70	3.97	3.33	4.67	3.97	3.31	4.73	3.97
1919.												
January–June	3.25	5.50	4.19	3.19	5.41	3.91	3.13	5.41	3.92	3.20	5.41	3.91
July–December	4.50	5.85	5.02	3.74	6.21	5.15	3.91	6.20½	5.18	4.13	6.73	5.15
1920.												
January	4.50	5.00	4.62	4.63	5.45	5.09	4.70	5.35	5.13	4.68	5.36	5.08
February	5.00	5.00	5.00	4.60	5.35	5.07	4.65	5.35	5.09	4.65	5.40	5.06
March	5.00	5.50	5.20	4.49	5.30	5.00	4.65	5.30	5.07	4.61	5.31	5.01
April	5.50	6.00	5.75	4.34	4.86	4.68	4.45	4.90	4.74	4.35	4.88	4.73
May	5.00	6.00	5.75	4.06	4.79	4.53	4.10	4.80	4.54	4.10	4.79	4.51
June	5.00	5.00	5.00	3.73½	4.19	3.92	3.85	4.20	4.18	3.88	4.13	4.00
January–June	4.50	6.00	5.22	3.73½	5.45	4.72	3.85	5.35	4.79	3.88	5.40	4.73
July	5.00	5.00	5.00	3.11	3.87	3.47	3.15	3.85	3.51	3.12	3.94	3.52
August	3.50	3.50	3.50	3.09½	3.65	3.29	3.20	3.45	3.34	3.20	3.47	3.35
September	3.50	3.50	3.50	3.06	3.43	3.23	3.10	3.45	3.25	3.08½	3.54	3.28
October	3.50	3.50	3.50	2.64½	3.09	2.83	2.61	3.10	2.84	2.67	3.12	2.85
November	....	....	....	1.87	3.06	2.28	1.83	2.76	2.28	1.93	2.73½	2.30
December	....	....	....	1.89	2.23	2.05	1.89	2.24	2.07	1.51¼	2.22	2.03
July–December	3.50	5.00	3.88	1.87	3.87	2.86	1.83	3.85	2.88	1.51¼	3.94	2.89

RICE.

TABLE 90.—*Rice: Area and production in undermentioned countries, 1909–1913, 1917–19.* *(expressed in terms of cleaned rice).*

Country.	Area.				Production.			
	Average[1] 1909–1913.	1917	1918	1919	Average[1] 1909–1913.	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
United States	749	981	1, 119	1, 090	681, 166	964, 972	1, 072, 389	1, 188, 611
Hawaii	9	4	4	....	25, 820	6, 913	6, 913	....
Porto Rico	16	....	....	....	4, 298	....	....	....
Central America:								
Guatemala	....	29	43	14	2, 680	20, 733	16, 997	5, 180
Costa Rica	7	....	....	1	....	....	....	....
Honduras	....	....	....	....	8, 100	....	....	....
Mexico	162	....	180	....	164, 299	....	[2] 24, 787	....
SOUTH AMERICA.								
Argentina	20	....	....	....	24, 057	....	....	....
Brazil, Sao Paula	228	....	....	....	99, 514	204, 327	....	....
British Guiana	38	58	....	....	69, 078	....	[2] 44, 300	....
Dutch Guiana	....	....	....	....	2, 754	[2] 11, 237	[2] 17, 649	....
Peru	138	86	....	....	100, 976	95, 166	....	....
EUROPE.								
Bulgaria [3]	7	12	14	[4] 4	7, 767	9, 047	7, 567	[4] 5, 474
France [3]	1	....	....	....	2, 017	....	....	....
Italy	361	341	342	325	646, 470	716, 359	712, 412	662, 333
Russia (Northern Caucasia)[3]	2	....	....	....	1, 049	....	....	....
Spain	95	106	111	112	297, 468	322, 130	282, 581	411, 798
ASIA.								
India:								
British India	70, 591	80, 141	79, 508	81, 548	72,949,786	81,197,760	55,218,240	80, 003, 840
Native States	2, 498	....	....	....	2, 634, 720	....	....	....
Ceylon	706	702	679	....	343, 614	....	....	....
Federated Malay States	125	....	....	....	80, 398	....	....	....
Japanese Empire:								
Japan	7, 357	7, 557	7, 580	7, 622	14,008,517	17,142,858	17,184,044	19, 106, 364
Formosa	1, 198	1, 152	....	....	1, 186, 174	1, 189, 579	....	1, 570, 777
Chosen (Korea)	2, 416	2, 865	....	....	2, 455, 522	2, 980, 837	3, 376, 112	2, 915, 060
Java and Madura	6, 021	7, 175	7, 128	[2] 8, 467	7, 349, 417	8, 323, 305	8, 464, 575	[2]11,481,089
Philippine Islands	2, 288	3, 029	3, 381	....	1, 123, 805	1, 745, 488	2, 209, 585	1, 976, 806
Russia, Transcaucasia and Turkestan [3]	614	....	....	....	378, 401	....	....	....
Straits Settlements	92	....	....	....	123, 204	....	....	....
Siam	5, 286	5, 429	....	....	6, 510, 985	....	....	....
AFRICA.								
Egypt (Lower)	241	273	385	150	552, 833	487, 163	691, 965	606, 864
Madagascar	....	....	....	....	953, 000	1,404,592	[2]1,545,000	....
Nyasaland	....	....	....	....	2, 212	2, 121	....	....
OCEANIA.								
Australia	....	....	....	....	75	....	....	....
Fiji	12	18	....	....	5, 916	....	....	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Unofficial. [3] Old boundaries. [4] New boundaries.

TABLE 91.—*Rice (cleaned): World production so far as reported, 1900–1915.*

Year.	Production.	Year.	Production.	Year.	Production.
	Pounds.		*Pounds.*		*Pounds.*
1900	100, 400, 000, 000	1906	105, 800, 000, 000	1912	97, 300, 000, 000
1901	94, 400, 000, 000	1907	100, 300, 000, 000	1913	100, 700, 000, 000
1902	101, 600, 000, 000	1908	102, 900, 000, 000	1914	102, 986, 000, 000
1903	101, 800, 000, 000	1909	127, 700, 000, 000	1915	115, 193, 190, 000
1904	110, 700, 000, 000	1910	126, 100, 000, 000		
1905	102, 400, 000, 000	1911	102, 100, 000, 000		

RICE—Continued.

TABLE 92.—*Rice: Acreage, production, value, exports, etc., in the United States, 1904–1920.*

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Domestic exports, year beginning July 1.[1]	Net imports, year beginning July 1.[1]
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*	*Bushels.*	*Bushels.*
1904	662,000	31.9	21,096,000	65.8	13,892,000	5,964,814	3,501,337
1905	482,000	28.2	13,607,000	95.2	12,956,000	3,612,289	5,593,750
1906	575,000	31.1	17,855,000	90.3	16,121,000	3,790,080	7,264,859
1907	627,000	29.9	18,738,000	85.8	16,081,000	3,033,788	7,333,910
1908	655,000	33.4	21,890,000	81.2	17,771,000	3,406,070	7,760,164
1909	720,000	33.8	24,368,000	....	....	....	....
1909	*610,000*	*35.8*	*21,839,000*	79.6	17,383,000	4,487,287	7,820,643
1910	723,000	33.9	24,510,000	67.8	16,624,000	5,134,355	7,292,960
1911	696,000	32.9	22,934,000	79.7	18,274,000	5,824,598	6,467,505
1912	723,000	34.7	25,054,000	93.5	23,423,000	5,672,996	7,539,206
1913	827,000	31.1	25,744,000	85.8	22,090,000	5,871,289	10,166,684
1914	694,000	34.1	23,649,000	92.4	21,849,000	7,334,389	7,848,181
1915	803,000	36.1	28,947,000	90.6	26,212,000	9,506,099	6,931,061
1916	869,000	47.0	40,861,000	88.9	36,311,000	12,315,486	6,180,934
1917	981,000	35.4	34,739,000	189.6	65,879,000	11,885,265	13,095,243
1918	1,119,000	34.5	38,606,000	191.8	74,042,000	12,892,196	5,309,014
1919	1,092,000	39.2	42,790,000	266.8	114,152,000	22,899,774	3,001,146
1920	1,337,000	40.2	53,710,000	118.9	63,837,000	....	....

[1] Domestic exports here include also shipments from the United States to Porto Rico and Hawaii; net imports are total imports minus reexports. Bushels are computed from pounds as reported in original by assuming 1 bushel of rough rice to yield 27⅞ pounds of cleaned rice.

TABLE 93.—*Rice: Acreage, production, and farm value, by States, 1920.*

State.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
North Carolina	400	25.0	10,000	167	17,000
South Carolina	4,100	25.0	102,000	290	296,000
Georgia	1,100	26.4	29,000	225	65,000
Florida	3,000	24.0	72,000	175	126,000
Missouri	500	50.0	25,000	131	33,000
Alabama	500	31.0	16,000	290	46,000
Mississippi	3,000	31.0	93,000	200	186,000
Louisiana	700,000	36.0	25,200,000	110	27,720,000
Texas	281,000	34.0	9,554,000	125	11,942,000
Arkansas	181,400	49.0	8,889,000	131	11,645,000
California	162,000	60.0	9,720,000	121	11,761,000
United States	1,337,000	40.2	53,710,000	118.9	63,837,000

TABLE 94.—*Rice: Condition of crop, United States, on first of months named, 1904–1920.*

Year.	July 1.	Aug. 1.	Sept. 1.	When harvested.	Year.	July 1.	Aug. 1.	Sept. 1.	When harvested.
1904	88.2	90.2	89.7	87.3	1913	88.4	88.7	88.0	80.3
1905	88.0	92.9	92.2	89.3	1914	86.5	87.6	88.9	88.0
1906	82.9	83.1	86.8	87.2	1915	90.5	90.0	82.3	80.9
1907	88.7	88.6	87.0	88.7	1916	92.7	92.2	91.2	91.5
1908	92.9	94.1	93.5	87.7	1917	85.1	85.0	78.4	79.7
1909	90.7	84.5	84.7	81.2	1918	91.1	85.7	83.7	85.4
1910	86.3	87.6	88.8	88.1	1919	89.5	90.4	91.9	91.3
1911	87.7	88.3	87.2	85.4	1920	90.0	88.7	88.3	88.1
1912	86.3	86.3	88.8	89.2					

RICE—Continued.

TABLE 95.—*Rice: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels). 10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	Farm price per bushel (cents). 10-year average, 1911–1920.	1916	1917	1918	1919	1920	Value per acre (dollars).[1] 5-year average, 1915–1919.	1920
N. C.	23.8	25.6	25.0	24.0	26.3	21.0	21.0	26.0	20.0	24.4	25.0	133	85	195	200	275	167	38.70	41.75
S. C.	22.8	11.7	25.0	30.0	26.0	24.3	14.0	25.0	23.0	24.4	25.0	151	90	195	195	300	290	40.25	72.50
Ga.	27.2	26.8	30.0	32.0	28.0	29.3	20.0	30.0	26.0	24.0	26.4	138	87	195	175	275	225	42.64	59.40
Fla.	24.8	25.0	25.0	25.0	25.0	25.0	25.0	26.0	24.0	24.0	24.0	122	75	195	140	263	175	36.98	42.00
Mo.	46.5	....	....	....	....	50.0	51.0	45.0	45.0	38.0	50.0	157	100	190	180	240	131	71.74	65.50
Ala.	25.9	20.0	30.0	22.0	28.0	25.0	25.0	27.0	25.0	26.4	31.0	134	75	190	150	270	290	39.52	89.90
Miss.	29.5	36.0	35.0	28.0	30.0	25.0	28.0	30.0	23.0	29.0	31.0	122	80	190	150	190	200	38.20	62.00
La.	33.7	31.5	33.5	39.0	32.1	34.2	46.0	31.0	28.8	35.2	36.0	130	90	190	195	271	110	56.53	39.60
Tex.	33.9	34.3	35.5	32.0	33.8	30.5	45.0	30.0	32.0	32.1	34.0	133	86	200	197	280	125	55.75	42.50
Ark.	42.3	39.0	37.5	36.0	39.8	48.4	50.5	41.0	37.9	44.0	49.0	129	96	190	180	240	131	69.24	64.19
Calif.	57.0	40.0	50.0	48.0	53.3	66.7	59.0	68.0	65.5	60.0	60.0	129	78	175	190	267	121	102.02	72.60
U. S.	36.5	32.9	34.7	31.1	34.1	36.1	47.0	35.4	34.5	39.2	40.2	129.8	88.9	189.6	191.8	266.8	118.9	62.47	47.75

[1] Based upon farm price Dec. 1.

TABLE 96.—*Rice: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost and freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	1.0	12.8	1.1	0.3	......	0.1	2.6	18.4	0.3	0.5	0.7	0.1	20.0
1918	7.2	7.2	2.5	.2	......	.4	1.5	18.8	.3	1.0	(1)	......	21.7
1917	17.3	.7	.1	1.5	0.1	.1	.1	20.0	.5	.2	.5	.1	25.4
1916	4.8	.2	......	.4	......	.3	.2	6.2	1.1	.3	......	.2	9.5
1915	7.0	.6	.1	.3	......	.4	8.1	16.7	.4	.2	......	(1)	19.4
1914	5.3	2.3	.1	......	(1)	.6	.6	10.1	.1	1.3	(1)	.3	17.5
1913	3.9	14.3	5.8	......	......	(1)	......	24.1	.1	.7	......	......	28.5
1912	3.1	1.1	6.2	......	......	.6	.5	11.6	2.5	2.0	.5	.6	19.6
1911	6.5	3.2	......	.2	......	.7	......	10.6	.7	.6	.5	.1	14.5
1910	7.2	1.7	......	.1	......	.1	1.0	10.1	3.4	.4	1.2	.3	17.3
1909	4.6	.1	......	......	......	1.1	6.6	12.4	2.7	.9	.2	.1	17.0
Average	6.7	3.1	1.5	.3	(1)	.4	1.8	14.1	1.2	.8	.3	.1	19.0

[1] Less than 0.05 per cent.

RICE—Continued.

TABLE 97.—*Rice: Wholesale price per pound, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York.			Cincinnati.			Lake Charles.			New Orleans.			Houston.		
	Domestic (good).[1]			Prime.			Rough (per 162 pounds).			Honduras, (cleaned).			Head, rice, (cleaned).[2]		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Dols.*	*Dols.*	*Dols.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June	4¾	5	......	5¼	6¼	......	2.50	3.82	......	2⅜	5⅝	......	4	5½	....
July-December	4¾	5¼	......	5¾	6¼	......	2.00	3.76	......	1.15	7	......	4¼	6	....
1914.															
January-June	4¾	5	......	5¾	6¼	......	1.40	3.76	......	1¼	6¼	......	3⅜	5¾	....
July-December	4¾	5⅞	......	5¾	6¼	......	2.00	4.55	......	1½	6⅝	......	3	5½	....
1915.															
January-June	5	5½	......	5¾	6½	......	2.85	4.61½	......	2¼	5¾	......	4½	5	....
July-December	4½	5½	......	5	6½	......	2.80	3.65	......	2	5½	......	4¾	5⅝	....
1916.															
January-June	5	5¼	......	5¼	5¾	......	2.65	4.25	......	2	5⅛	......	3¾	4¾	....
July-December	5	5½	......	5¼	5¾	......	2.60	3.65	......	2¼	5¼	......	3¾	4¾	....
1917.															
January-June	5¼	9	......	5¼	8¼	......	2.70	7.00	......	2½	8½	......	4¾	8	....
July-December	7⅜	9¼	......	8	8¾	......	5.34	7.50	......	4½	8½	......	7	8¼	....
1918.															
January-June	8¾	10¼	9.4	8½	10	9.0	[3]5.00	[3]8.50	[3]7.57	5⅛	9⅝	7.7	8	9½	8.6
July-December	9¾	10¾	10.2	10	10½	10.1	[4]5.00	[4]7.50	[4]7.16	4½	10⅛	7.6	9⅛	9⅝	9.1
1919.															
January-June	10¼	12	10.7	10	11½	10.8	2.50	7.25	6.70	4½	11½	7.9	9⅛	13	9.4
July-December	13	14½	14.0	10¼	14½	13.1	......	......	......	6	14½	11.5	9.2	14	11.9
1920.															
January	14	15	14.8	13½	14¼	13.7	......	......	......	11½	14	12.7	12½	13	12.8
February	14½	15	14.8	13¾	15	14.4	......	......	......	11½	14½	12.8	12	13	12.5
March	14½	15	14.8	14½	15½	15.2	......	......	......	11	14½	12.5	12½	13	12.8
April	14½	15	14.8	15	15½	15.2	......	......	......	11	13⅝	12.3	12¼	12¾	12.5
May	14½	15	14.8	15	15½	15.2	......	......	......	11	13½	12.2	11¾	12½	12
June	14½	15	14.8	15	15½	15.2	......	......	......	11	14	12.3	11¼	12	11.6
January-June	14	15	14.8	13½	15½	14.8	......	......	......	11	14½	12.5	11¼	13	12.4
July	14	15	14.4	15	15½	15.2	......	......	......	11	14	12.5	10¾	11¾	11.2
August	13	14½	14.0	15	15½	15.2	......	......	......	10	11	10.6	8	11¾	10
September	13	13½	13.2	15	15½	15.2	......	......	......	8	10½	9.6	7½	8	7.8
October	8¾	13½	11.1	13	15½	13.8	......	......	......	6	9½	7.9	6¼	7½	6.9
November	6½	8	7.4	10	13½	12.6	......	......	......	6	8¼	6.9	6½	6¼	6.2
December	8¼	8⅞	8.5	9	10	9.6	......	......	......	6	7¼	6.6	6	6¼	6.1
July-December	6½	15	11.4	9	15½	13.6	......	......	......	6	14	9.0	6	11¾	8.0

[1] Fancy head, 1919–1920.
[2] Honduras, 1919-1920.
[3] Five months, average.
[4] Fancy, subsequent to June, 1918.

RICE—Continued.

TABLE 98.—*Rice: International trade, calendar years 1909–1919.*[1]

[Mostly cleaned rice. Under rice is included paddy, unhulled, rough, cleaned, polished, broken, and cargo rice, in addition to rice flour and meal. Rice bran is not included. Rough rice or paddy, where specifically reported, has been reduced to terms of cleaned rice at ratio of 162 pounds of rough or unhulled to 100 pounds of cleaned. "Rice, other than whole or cleaned rice," in the returns of United Kingdom is not considered paddy, since the chief sources of supply indicate that it is practically all hulled rice. Cargo rice, a mixture of hulled and unhulled, is included without being reduced to terms of cleaned. Broken rice and rice flour and meal are taken without being reduced to terms of whole cleaned rice. See "General note," Table 15.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Belgium	99,948	....	....	....	....	....	8,233
British India	5,337,516	4,520,152	2,879,591	3,757,332	3,847,321	5,488,517	1,598,220
Dutch East Indies	132,400	109,417	70,841	29,354	12,747	....	....
France	79,087	123,021	113,098	41,874	9,850	3,840	23,404
French Indo-China	2,288,040	3,060,373	2,977,728	....	....	....	....
Germany	396,628	....	....	....	....	....	....
Netherlands	476,276	533,421	7,545	9,127	16	3	223
Penang	357,548	354,835	....	....	....	....	....
Siam	1,928,507	2,421,283	2,474,027	2,627,550	2,496,924	1,893,524	987,926
Singapore	758,875	908,438	....	....	....	....	....
Other countries	866,020	1,186,173	696,377	735,412	713,516	446,118	....
Total	12,720,845	13,217,113	9,228,207	7,201,149	7,080,374	7,832,002	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	183,411	....	....	....	....	....	....
Belgium	180,830	....	....	....	....	....	27,527
Brazil	24,753	14,407	15,317	1,575	78	2	2
British India	278,272	331,065	391,607	416,610	383,198	341,532	285,928
Ceylon	821,654	866,892	842,331	956,048	922,530	762,405	....
China	704,992	908,534	1,130,141	1,504,536	1,311,624	931,203	....
Cuba	262,207	254,150	319,894	369,769	324,810	387,892	....
Dutch East Indies	1,178,111	1,058,978	1,286,246	1,527,183	1,669,448	....	....
Egypt	98,690	110,933	54,809	17,368	32,207	10,510	204
France	517,861	761,106	525,290	451,681	525,483	377,676	349,761
Germany	913,772	....	....	....	....	....	....
Japan	655,676	674,215	152,535	103,053	188,125	1,549,056	....
Mauritius	132,543	138,412	128,890	175,689	106,739	131,665	....
Netherlands	778,682	776,891	128,756	144,254	35,406	10,755	39,485
Penang	511,035	537,749	....	....	....	....	....
Perak	179,187	207,764	186,268	....	....	....	....
Philippine Islands	412,781	213,673	481,576	418,512	324,045	428,807	....
Russia	250,461	268,513	303,729	166,779	....	....	....
Selangor	159,178	190,084	178,438	....	....	....	....
Singapore	975,095	1,279,688	....	....	....	....	....
United Kingdom	768,853	756,144	1,305,701	988,577	818,152	849,032	166,626
United States	209,814	232,316	254,568	215,712	266,471	536,089	163,308
Other countries	1,242,092	1,109,116	1,057,976	935,835	841,700	1,310,611	....
Total	11,439,950	10,690,630	8,744,072	8,393,181	7,750,016	7,627,235	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

CEREALS CONSUMED.

TABLE 99.—*Consumption of specified cereals in selected countries, yearly average.*

1909-1913.

Country.	Average yearly production, 1909-1913.	Average yearly net imports (+) or exports (—), trade years 1909-10 to 1913-14.	Average yearly total consumption, 1909-1913.	Mean yearly population, 1909-1913.	Average yearly consumption per capita 1909-1913.
BARLEY (INCLUDING MALT CONVERTED TO BARLEY).					
	Bushels.	*Bushels.*	*Bushels.*	*Number.*	*Bushels.*
Austria-Hungary	147, 795, 000	— 7, 399, 000	140, 396, 000	51, 783, 777	2. 71
Belgium	4, 247, 000	+[1] 15, 056, 000	19, 303, 000	7, 497, 119	2. 57
France	46, 489, 000	+ 6, 063, 000	52, 552, 000	39, 561, 600	1. 33
Germany	153, 529, 000	+ 149, 072, 000	302, 601, 000	65, 781, 875	4. 60
India (British)[2]	43, 237, 000	— 10, 227, 000	33, 010, 000	244, 267, 542	. 14
Italy	10, 104, 000	+ 818, 000	10, 922, 000	34, 681, 653	. 31
Japan	89, 528, 000	+ 14, 000	89, 542, 000	51, 775, 737	1. 73
Netherlands	3, 270, 000	+ 11, 064, 000	14, 334, 000	6, 030, 634	2. 38
United Kingdom	64, 760, 000	+ 48, 060, 000	112, 820, 000	45, 175, 723	2. 50
United States[3]	181, 881, 000	— 13, 022, 000	168, 859, 000	93, 638, 478	1. 80
CORN (INCLUDING CORN MEAL CONVERTED TO CORN).					
Austria-Hungary	216, 601, 000	+ 15, 074, 000	231, 675, 000	51, 783, 777	4. 47
Belgium	No data.	+[1] 17, 267, 000	17, 267, 000	7, 497, 119	2. 30
France	22, 229, 000	+ 19, 806, 000	42, 035, 000	39, 561, 600	1. 06
Germany	No data.	+ 31, 967, 000	31, 967, 000	65, 781, 875	. 49
India (British)	87, 240, 000	No data.	87, 240, 000	244, 267, 542	. 36
Italy	100, 349, 000	+ 14, 503, 000	114, 852, 000	34, 681, 653	3. 31
Japan[2]	3, 304, 000	+ 87, 000	3, 391, 000	51, 775, 737	. 07
Netherlands	No data.	+ 21, 735, 000	21, 735, 000	6, 030, 634	3. 60
United Kingdom	No data.	+ 80, 602, 000	80, 602, 000	45, 175, 723	1. 78
United States[3]	2, 708, 334, 000	— 39, 286, 000	2, 669, 048, 000	93, 638, 478	28. 50
OATS.					
Austria-Hungary	239, 421, 000	+ 2, 163, 000	241, 584, 000	51, 783, 777	4. 67
Belgium	40, 905, 000	+[1] 8, 185, 000	49, 090, 000	7, 497, 119	6. 55
France	310, 020, 000	+ 29, 845, 000	339, 865, 000	39, 561, 600	8. 59
Germany	591, 996, 000	+ 3, 231, 000	595, 227, 000	65, 781, 875	9. 05
India (British)	No data.	+ 34, 000	No data.	244, 267, 542	....
Italy	36, 945, 000	+ 8, 150, 000	45, 095, 000	34, 681, 653	1. 30
Japan	No data.	— 34, 000	No data.	51, 775, 737	....
Netherlands	18, 512, 000	+ 8, 095, 000	26, 607, 000	6, 030, 634	4. 41
United Kingdom	182, 777, 000	+ 66, 352, 000	249, 129, 000	45, 175, 723	5. 51
United States[3]	1, 131, 175, 000	— 25, 112, 000	1, 106, 063, 000	93, 638, 478	11. 81
RICE (MOSTLY CLEANED, AND INCLUDING RICE FLOUR, RICE MEAL, AND BROKEN RICE).[4]					
	Pounds.	*Pounds.*	*Pounds.*	*Number.*	*Pounds.*
Austria-Hungary	No data.	+ 182, 921, 000	182, 921, 000	51, 783, 777	3. 53
Belgium	No data.	+ 80, 882, 000	80, 882, 000	7, 497, 119	10. 79
France	2, 017, 000	+ 438, 774, 000	440, 791, 000	39, 561, 600	11. 14
Germany	No data.	+ 517, 145, 000	517, 145, 000	65, 781, 875	7. 86
India (British)	72, 949, 786, 000	—5, 059, 244, 000	67, 890, 542, 000	244, 267, 542	277. 94
Italy	646, 470, 000	— 128, 162, 000	518, 308, 000	34, 681, 653	14. 94
Japan	14, 008, 517, 000	+ 593, 675, 000	14, 602, 192, 000	51, 775, 737	282. 03
Netherlands	No data.	+ 302, 407, 000	302, 407, 000	6, 030, 634	50. 15
United Kingdom	No data.	+ 678, 290, 000	678, 290, 000	45, 175, 723	15. 01
United States	681, 166, 000	+ 193, 599, 000	874, 765, 000	93, 638, 478	9. 34

[1] July, 1914, not included in average.
[2] Two-year average, 1912-1913.
[3] Excluding insular possessions.
[4] Trade figures for rice are for calendar years.

CEREALS CONSUMED—Continued.

TABLE 99.—*Consumption of specified cereals in selected countries, yearly average*—Con.

1909-1913—Continued.

RYE (INCLUDING RYE FLOUR CONVERTED TO RYE).

Country.	Average yearly production, 1909–1913.	Average yearly net imports (+) or exports (−), trade years 1909-10 to 1913-14.	Average yearly total consumption, 1909–1913.	Mean yearly population. 1909–1913.	Average yearly consumption per capita, 1909–1913.
	Bushels.	*Bushels.*	*Bushels.*	*Number.*	*Bushels.*
Austria-Hungary	164, 143, 000	− 1, 256, 000	162, 887, 000	51, 783, 777	3. 15
Belgium	22, 675, 000	+[1]4, 889, 000	27, 564, 000	7, 497, 119	3. 68
France	48, 647, 000	+ 3, 197, 000	51, 844, 000	39, 561, 600	1. 31
Germany	445, 222, 000	−26, 424, 000	418, 798, 000	65, 781, 875	6. 37
India (British)	No data.	No data.	No data.	244, 267, 542	....
Italy	5, 328, 000	+ 618, 000	5, 946, 000	34, 681, 653	. 17
Japan	No data.	No data.	No data.	51, 775, 737	....
Netherlands	16, 422, 000	+11, 539, 000	27, 961, 000	6, 030, 634	4. 64
United Kingdom	1, 751, 000	+[2]2, 122, 000	3, 873, 000	45, 175, 723	. 09
United States	34, 916, 000	− 3, 336, 000	31, 580, 000	93, 638, 478	. 34

WHEAT (INCLUDING WHEAT FLOUR CONVERTED TO WHEAT).

Country.	Average yearly production, 1909–1913.	Average yearly net imports (+) or exports (−), trade years 1909-10 to 1913-14.	Average yearly total consumption, 1909–1913.	Mean yearly population. 1909–1913.	Average yearly consumption per capita, 1909–1913.
Austria-Hungary	217, 598, 000	+ 10, 512, 000	228, 110, 000	51, 783, 777	4. 41
Belgium	14, 583, 000	+[1]49, 390, 000	63, 973, 000	7, 497, 119	8. 53
France	317, 254, 000	+ 43, 673, 000	360, 927, 000	39, 561, 600	9. 12
Germany	152, 119, 000	+[3]68, 339, 000	220, 458, 000	65, 781, 875	3. 35
India (British)	350, 736, 000	− 49, 589, 000	301, 147, 000	244, 267, 542	1. 23
Italy	183, 260, 000	+ 53, 219, 000	236, 479, 000	34, 681, 653	6. 82
Japan	25, 274, 000	+ 4, 064, 000	29, 338, 000	51, 775, 737	. 57
Netherlands	4, 976, 000	+ 21, 976, 000	26, 952, 000	6, 030, 634	4. 47
United Kingdom	61, 481, 000	+216, 054, 000	277, 535, 000	45, 175, 723	6. 14
United States	686, 691, 000	−154, 878, 000	531, 813, 000	93, 638, 478	5. 68

[1] July, 1914, not included.
[2] Calendar year.
[3] Including Luxemburg.

1914-1918.

BARLEY (INCLUDING MALT CONVERTED TO BARLEY).

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
	Bushels.	*Bushels.*	*Bushels.*	*Number.*	*Bushels.*
Austria-Hungary [1]	109, 760, 000	No data.	No data.	53, 279, 370	....
Belgium [1]	4, 116, 000	No data.	No data.	7, 752, 390	....
France	35, 503, 000	+ 8, 293, 000	43, 796, 000	37, 769, 600	1. 16
Germany [2]	113, 222, 000	No data.	No data.	69, 149, 378	....
India (British)	145, 273, 000	− 8, 948, 000	136, 325, 000	250, 598, 343	. 54
Italy	9, 123, 000	+ 2, 056, 000	11, 179, 000	36, 407, 653	. 31
Japan	88, 323, 000	+ 84, 000	88, 407, 000	55, 527, 016	1. 59
Netherlands	2, 729, 000	+ 3, 734, 000	6, 463, 000	6, 448, 547	1. 00
United Kingdom	58, 244, 000	+28, 800, 000	87, 044, 000	43, 582, 551	2. 00
United States [3]	214, 819, 000	−26, 303, 000	188, 516, 000	100, 740, 142	1. 87

CORN (INCLUDING CORN MEAL CONVERTED TO CORN).

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
Austria-Hungary [1]	217, 839, 000	No data.	No data.	53, 279, 370	....
Belgium [1]	No data.	No data.	No data.	7, 861, 926	....
France	16, 187, 000	+12, 170, 000	28, 357, 000	37, 769, 600	0. 75
Germany [2]	No data.	No data.	No data.	69, 149, 378	....
India (British)	90, 224, 000	− 1, 078, 000	89, 146, 000	250, 598, 343	. 36
Italy	93, 540, 000	+ 7, 471, 000	101, 011, 000	36, 407, 653	2. 77
Japan	3, 885, 000	+ 95, 000	3, 980, 000	55, 527, 016	. 07
Netherlands	No data.	+17, 445, 000	17, 445, 000	6, 483, 590	2. 69
United Kingdom	No data.	+58, 287, 000	58, 287, 000	43, 582, 551	1. 34
United States [2]	2, 760, 484, 000	−41, 106, 000	2, 719, 378, 000	100, 740, 142	26. 99

[1] Two-year average, 1914–15. No further data available.
[2] Excludes Alsace-Lorraine.
[3] Excluding insular possessions.

CEREALS CONSUMED—Continued.

TABLE 99.—*Consumption of specified cereals in selected countries, yearly average*—Con.

1914-1918—Continued.

OATS.

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
	Bushels.	*Bushels.*	*Bushels.*	*Number.*	*Bushels.*
Austria-Hungary [1]	186, 601, 000	No data.	No data.	53, 279, 370	....
Belgium [1]	44, 871, 000	No data.	No data.	7, 752, 390	....
France	236, 190, 000	+ 43, 642, 000	279, 832, 000	37, 769, 600	7. 41
Germany [2]	403, 983, 000	No data.	No data.	69, 149, 378	....
India (British)	No data.	− 80, 000	No data.	250, 598, 343	....
Italy	32, 718, 000	+ 23, 713, 000	56, 431, 000	36, 407, 653	1. 55
Japan	No data.	− 287, 000	No data.	55, 527, 016	....
Netherlands	20, 020, 000	+ 2, 745, 000	22, 765, 000	6, 448, 547	3. 53
United Kingdom	202, 508, 000	+ 44, 371, 000	246, 879, 000	43, 582, 551	5. 66
United States [3]	1, 414, 558, 000	−104, 714, 000	1, 309, 844, 000	100, 740, 142	13. 00

RICE (MOSTLY CLEANED, AND INCLUDING RICE FLOUR, RICE MEAL, AND BROKEN RICE).[4]

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
	Pounds.	*Pounds.*	*Pounds.*	*Number.*	*Pounds.*
Austria-Hungary	No data.	No data.	No data.	53, 920, 339	....
Belgium	No data.	No data.	No data.	7, 861, 926	....
France	No data.	+ 469, 910, 000	469, 910, 000	37, 769, 600	12. 44
Germany [2]	No data.	No data.	No data.	69, 149, 378	....
India (British)	69, 779, 136, 000	−3, 725, 780, 000	66, 053, 356, 000	250, 598, 343	263. 58
Italy	728, 198, 000	+ 127, 390, 000	855, 588, 000	36, 407, 653	23. 50
Japan	17, 632, 967, 000	+ 407, 271, 000	18, 040, 238, 000	55, 527, 016	324. 89
Netherlands	No data.	+ 109, 190, 000	109, 190, 000	6, 521, 217	16. 74
United Kingdom	No data.	+ 883, 137, 000	883, 137, 000	43, 582, 551	20. 26
United States [3]	926, 678, 000	+ 176, 166, 000	1, 102, 844, 000	100, 740, 142	10. 95

RYE (INCLUDING RYE FLOUR CONVERTED TO RYE).

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
	Bushels.	*Bushels.*	*Bushels.*	*Number.*	*Bushels.*
Austria-Hungary [5]	109, 916, 000	No data.	No data.	53, 279, 370	....
Belgium [5]	20, 568, 000	No data.	No data.	7, 752, 390	....
France	30, 441, 000	+ 390, 000	30, 831, 000	37, 769, 600	0. 82
Germany [2]	341, 185, 000	No data.	No data.	69, 149, 378	....
India (British)	No data.	No data.	No data.	250, 598, 343	....
Italy	4, 931, 000	+ 1, 035, 000	5, 966, 000	36, 407, 653	.16
Japan	No data.	No data.	No data.	55, 527, 016	....
Netherlands	12, 914, 000	+ 1, 232, 000	14, 146, 000	6, 521, 217	2. 17
United Kingdom [5]	1, 750, 000	+[6] 1, 728, 000	3, 478, 000	45, 285, 376	.08
United States [3]	59, 937, 000	−18, 602, 000	41, 335, 000	100, 740, 142	.41

WHEAT (INCLUDING WHEAT FLOUR CONVERTED TO WHEAT).

Country.	Average yearly production, 1914–1918.	Average yearly net imports (+) or exports (−), trade years 1914–15 to 1918–19.	Average yearly total consumption, 1914–1918.	Mean yearly population, 1914–1918.	Average yearly consumption per capita, 1914–1918.
Austria-Hungary [5]	162, 241, 000	No data.	No data.	53, 279, 370	....
Belgium [6]	10, 986, 000	No data.	No data.	7, 752, 390	....
France	214, 137, 000	+ 80, 813, 000	294, 950, 000	37, 769, 600	7. 81
Germany [2]	110, 655, 000	No data.	No data.	69, 149, 378	....
India (British)	332, 852, 000	− 28, 796, 000	304, 056, 000	250, 598, 343	1. 21
Italy	167, 989, 000	+ 74, 041, 000	242, 030, 000	36, 407, 653	6. 65
Japan	29, 492, 000	+ 206, 000	29, 698, 000	55, 527, 016	.53
Netherlands	5, 157, 000	+ 17, 674, 000	22, 831, 000	6, 448, 547	3. 54
United Kingdom	72, 939, 000	+191, 929, 000	264, 868, 000	43, 582, 551	6. 08
United States [3]	822, 246, 000	−224, 761, 000	597, 475, 000	100, 740, 142	5. 93

[1] Two-year average, 1914–15. No further data available.
[2] Excludes Alsace-Lorraine.
[3] Excluding insular possessions.
[4] Trade years for rice are calendar years.
[5] Two-year average, 1914–15.
[6] Calendar year.

STATISTICS OF CROPS OTHER THAN GRAIN CROPS.

POTATOES.

TABLE 100.—*Potatoes: Area and production in undermentioned countries, 1909–1920.*

AREA.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
United States	3,680	3,711	3,734	3,565	4,384	4,295	3,952	3,929
Canada;								
Prince Edward Island	32	32	31	31	35	32	36	36
Nova Scotia	32	32	34	34	41	51	62	50
New Brunswick	42	44	40	39	46	57	76	78
Quebec	120	115	117	112	227	265	316	311
Ontario	156	154	155	133	142	166	157	158
Manitoba	26	27	30	32	34	45	42	37
Saskatchewan	29	31	35	47	68	60	66	54
Alberta	24	26	28	29	49	44	46	43
British Columbia	14	15	16	15	15	15	18	18
Total	475	476	486	472	657	735	819	785
Mexico								
Newfoundland								
Total	4,155							
SOUTH AMERICA.								
Argentina	235	293	306	322	331	333		
Chile	66	81	78	79	70	78	78	
Total	301	374	384	401	401	411		
EUROPE.								
Austria	[2] 3,105	[3] 1,774	[3] 1,757	[4] 2,460	287	323	[16] 239	
Hungary proper [2]	1,521	1,513	1,577					[5] 622
Croatia Slavonia [2]	193							
Bosnia Herzegovina	69							
Belgium	390	411					319	331
Bulgaria, [2]	8						[5] 19	[5] 15
Czecho-Slovakia							[6] 549	1,512
Denmark	145	151	160	159	143	186	226	216
Finland	181						204	208
Alsace-Lorraine	229	228	219					
France [2]	3,841	3,676	3,223	3,163	3,482	2,884	[7] 3,041	[7] 3,332
Germany [2]	8,260	8,367	8,827	[7] 6,782	[7] 6,186	[7] 6,740	[7] 5,387	[7] 6,054
Italy	658	727	725	729	732	739	763	741
Jugo-Slavia								519
Luxemburg	36	37	36	34	27	25		
Malta	4	4	3	3				
Netherlands	414	424	438	413	419	405	426	421
Norway	102	104	113	114	145	133	132	132
Roumania [2 8]	28	26	28	35		[9] 78	[10] 142	[11] 248
Do. [2 12]	58	56	52			[13] 38	[14] 38	
Russia proper [2]	8,302	8,652	6,815	5,879				
Poland [2]	2,628						[15] 3,012	[16] 4,129
Northern Caucasia [2]	197	204	165					

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] Includes Galicia, but excludes Bukowina, Goritz, and Gradisca.
[5] New boundaries.
[6] Bohemia and Moravia only.
[7] Excludes Alsace-Lorraine.
[8] Grown alone.
[9] Former Kingdom and Bessarabia.
[10] Former Kingdom, Bessarabia, and Bukowina.
[11] Former Kingdom, Bessarabia, Bukowina, and Transylvania.
[12] Grown with corn.
[13] Excludes Dobrudja.
[14] Former Kingdom only.
[15] Includes Congress Poland, Eastern and Western Galicia, and Gradisca.
[16] Unofficial.

POTATOES—Continued.

TABLE 100.—*Potatoes: Area and production in undermentioned countries, 1909–1920*—Continued.

AREA—Continued.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
EUROPE—continued.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*
Serbia[2]	30	...	...	...	...	...	...	...
Spain	687	688	734	744	839	728	805	805
Sweden	379	375	382	373	397	398	417	365
Switzerland	186	137	159	200	140	168	136	123
United Kingdom;								
England	408	436	437	400	473	597	446	517
Scotland	145	152	144	130	148	169	155	162
Wales	26	25	26	28	35	37	29	28
Ireland	590	583	594	586	709	702	589	584
Total	1,169	1,196	1,201	1,144	1,365	1,505	1,219	1,291
Total Europe	32,594	...	...	...	...	...	...	...
ASIA.								
Japan	174	205	225	254	299	324	343	334
Russia:								
Central Asia (4 governments)[2]	99	104	106	...	...	...	...	...
Siberia (4 governments)[2]	298	411	296	...	...	...	...	...
Transcaucasia (1 government)[2]	2	2	2	...	...	...	...	...
Total Asia	573	752	629	...	...	...	...	...
AFRICA.								
Algeria	45	...	...	...	27	...	44	42
Union of South Africa	62	...	...	...	110	...	...	...
Total	107	...	...	...	137	...	...	...
AUSTRALASIA.								
Australia;								
Queensland	8	10	8	6	9	11	6	...
New South Wales	39	39	30	20	22	23	21	...
Victoria	55	75	65	57	71	67	52	...
South Australia	8	11	8	4	5	1	3	...
Western Australia	3	5	5	5	6	4	4	...
Tasmania	21	31	32	29	31	27	25	...
Total	137	171	148	121	150	136	111	...
New Zealand	28	29	22	30	26	23	...	...
Total Australasia	165	200	170	150	176	159	...	...
Grand total	37,895	...	...	...	...	...	...	...

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.

POTATOES—Continued.

TABLE 100.—*Potatoes: Area and production in undermentioned countries, 1919–1920*—Continued.

PRODUCTION.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
NORTH AMERICA.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	356, 627	409, 921	359, 721	286, 953	442, 108	411, 860	355, 773	430, 458
Canada:								
Prince Edward Island	5, 901	6, 806	3, 558	6, 386	6, 125	5, 362	4, 529	6, 175
Nova Scotia	6, 627	7, 165	4, 759	6, 935	7, 173	9, 776	9, 992	10, 209
New Brunswick	8, 898	10, 534	5, 772	7, 488	6, 891	9, 078	10, 790	15, 510
Quebec	19. 723	21, 811	17, 510	14, 672	18, 158	38, 936	57, 280	57, 633
Ontario	20, 720	25, 772	14, 362	8, 113	18, 981	19, 376	15, 145	23, 962
Manitoba	4, 755	3, 172	2, 565	4, 709	3, 643	8, 325	5, 288	3, 410
Saskatchewan	4, 812	4, 085	3, 847	7, 319	9, 010	6, 951	11, 250	6, 861
Alberta	3, 934	3, 652	4, 024	4, 783	7, 409	3, 119	8, 241	7, 138
British Columbia	3, 128	2, 675	3, 956	2, 892	2, 502	3, 423	3, 060	2, 934
Total	78, 498	85, 672	60, 353	63, 297	79, 892	104, 346	125, 575	133, 832
Mexico	924			540		328	452	
Newfoundland	1, 495							
Total	437, 544							
SOUTH AMERICA.								
Argentina	40, 216	28, 366	29, 597	31, 138				
Chile	8, 023	9, 169	9, 546	11, 598	9, 091	9, 768	[7] 8, 700	[7] 10, 944
Total	48, 239	37, 535	39, 143	42, 736				
EUROPE.								
Austria	[2] 456, 485	[2] 285, 070	[3] 232, 203	[4] 229, 048	32, 890	21, 495	[7] 20, 022	
Hungary proper[2]	180, 103	195, 266	209, 356					[5] 71, 568
Croatia-Slavonia[2]	22, 254							
Bosnia-Herzegovina[2]	3, 359							
Belgium	107, 021						76, 064	57, 094
Bulgaria	[2] 454							2, 023
Czecho-Slovakia							[6] 79, 566	
Denmark	32, 440	37, 331	42, 349	26, 629	31, 882	40, 605	53, 087	
Finland	20, 975	18, 736	20. 531	19, 666		[7] 22, 569	17, 718	17, 865
France[2]	489, 377	440, 652	332, 788	332, 647	401, 336	228, 433	[8] 284, 047	[8] 379, 029
Alsace-Lorraine	37, 417	32, 082	39, 983			12, 041	27, 598	
Germany[2]	1, 681, 959	1, 674, 377	1. 983, 161	[8] 907, 236	[8] 1,264,374	[8] 1,082,816	[8] 788, 115	[9] 750, 885
Jugo-Slavia								38, 452
Italy	60, 813	61, 104	56, 768	54, 277	48, 112	51, 808	50, 981	51, 440
Luxemburg	6, 439	5, 288	6, 422	2, 971	5, 925	4, 731		
Malta	672	1, 080	568	356				
Netherlands	110, 153	120, 786	126, 741	105, 040	130, 288	109, 655	96, 225	91, 303
Norway	24, 821	27, 542	19, 957	31, 310	42, 584	28, 954	37, 912	30, 811
Roumania[2,10]	3, 634	2, 674	3, 765			2, 431	[11] 10, 442	[12] 3, 226
Do.[2,13]	1, 144	1, 083	865			[14] 250	[15] 401	
Russia proper[2]	862, 798	891, 579	770, 709	662, 169				
Poland[2]	373, 917						[16] 390,325	[7] 703, 194
Northern Caucasia[2]	15, 663	17, 907	15, 796					
Serbia[2]	2, 201							
Spain	93, 413	76, 657	101, 037	108, 991	113, 477	95, 562	102, 418	104, 761
Sweden	60, 327	63, 209	71. 756	54, 972	83, 700	71, 129	77, 573	60, 259
Switzerland	40, 537	22, 046	30, 681	18, 372	38, 580	43, 355	27. 925	28, 256

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Excludes Galicia and Bukowina.
[4] Includes Galicia but excludes Bukowina, Goritz, and Gradisca.
[5] New boundaries.
[6] Bohemia and Moravia only.
[7] Unofficial.
[8] Excludes Alsace-Lorraine.
[9] Prussia only.
[10] Grown alone.
[11] Former Kingdom, Bessarabia, and Bukowina.
[12] Bessarabia only.
[13] Grown with corn.
[14] Excludes Dobrudja.
[15] Former Kingdom only.
[16] Includes Congress Poland, Eastern and Western Galicia, and Posen.

POTATOES—Continued.

TABLE 100.—*Potatoes: Area and production in undermentioned countries, 1919–1920*—Continued.

PRODUCTION—Continued.

Country.	Average[1] 1909–1913.	1914	1915	1916	1917	1918	1919	1920
EUROPE—continued.	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United Kingdom:								
England	94,487	104,804	100,881	88,484	117,351	148,848	95,984	113,419
Scotland	34,674	40,230	36,291	19,825	41,443	42,971	31,061	46,181
Wales	5,403	5,445	5,821	5,018	7,380	8,288	6,048	3,696
Ireland	119,874	128,642	138,509	90,845	155,036	144,231	102,539	74,141
Total United Kingdom	254,438	279,121	281,502	204,172	321,210	344,338	235,632	237,437
Total	4,905,397	....	....	....	....	....	....	....
ASIA.								
Japan	24,738	32,312	35,103	38,613	36,924	41,275	67,236	47,278
Russia:								
Central Asia (4 governments)[2]	5,230	7,560	7,974	....	....	....	....	....
Siberia (4 governments)[3]	27,773	47,075	24,307	....	....	....	....	....
Transcaucasia (1 government)[2]	148	90	100	....	....	....	....	....
Total Russia	33,151	54,725	32,381	....	....	....	....	....
Total Asia	57,889	87,037	67,484	....	....	....	....	....
AFRICA.								
Algeria	1,783	....	....	....	2,756	....	....	985
Union of South Africa	3,269	....	....	....	....	3,909	3,649	....
Total	5,052	....	....	....	....	....	....	....
AUSTRALASIA.								
Australia:								
Queensland	524	618	598	278	726	827	413	....
New South Wales	3,378	3,989	1,520	1,658	1,691	1,865	1,133	....
Victoria	5,983	6,593	7,064	6,489	7,018	6,802	5,136	....
South Australia	894	1,230	673	485	759	422	493	....
Western Australia	309	665	550	527	629	423	437	....
Tasmania	2,989	3,001	2,946	2,983	2,503	2,630	2,110	....
Total	14,077	16,096	13,351	12,420	13,326	12,969	9,722	....
New Zealand	6,047	5,869	4,952	4,809	4,992	3,756	....	....
Total Australasia	20,124	21,965	18,303	17,229	18,318	16,725	....	....
Grand total	5,471,245	....	....	....	....	....	....	....

[1] Five-year average, except in a few cases where five-year statistics were unavailable.
[2] Excludes Galicia and Bukowina.

POTATOES—Continued.

TABLE 101.—*Potatoes: World production so far as reported, 1900–1915.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*
1900	4, 382, 031, 000	1904	4, 298, 049, 000	1908	5, 295, 043, 000	1912	5, 872, 953, 000
1901	4, 669, 958, 000	1905	5, 254, 598, 000	1909	5, 595, 567, 000	1913	5, 802, 910, 000
1902	4, 674, 000, 000	1906	4, 789, 112, 000	1910	5, 242, 278, 000	1914	5, 016, 291, 000
1903	4, 409, 793, 000	1907	5, 122, 078, 000	1911	4, 842, 109, 000	1915	5, 361, 898, 000

TABLE 102.—*Potatoes: Average yield per acre in undermentioned countries, 1900–1920.*

Year.	United States.[1]	Russia (European).[1]	Germany.[1]	Austria.[1]	Hungary proper.[1]	France.[1]	United Kingdom.[1]
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1900–1909	91. 4	99. 9	200. 0	151. 1	118. 7	133. 8	193. 8
1910–1915	97. 6	107. 9	205. 7	145. 6	122. 2	116. 3	222. 8
1906	102. 2	94. 9	193. 3	158. 4	128. 7	99. 5	192. 2
1907	95. 4	102. 4	205. 3	173. 2	126. 6	136. 2	171. 0
1908	85. 7	102. 9	209. 2	154. 0	96. 6	163. 7	231. 1
1909	106. 8	111. 5	208. 9	157. 3	125. 2	160. 3	222. 1
1910	93. 8	121. 1	196. 1	160. 0	117. 4	81. 9	209. 1
1911	80. 9	104. 2	153. 9	137. 2	106. 3	121. 8	241. 5
1912	113. 4	121. 5	223. 5	149. 0	129. 2	142. 9	177. 0
1913	90. 4	110. 6	235. 8	134. 7	118. 4	127. 3	242. 0
1914	110. 5	102. 8	200. 1	160. 7	129. 0	119. 9	233 3
1915	96. 3	87. 1	224. 7	132. 1	132. 8	103. 9	234. 1
1916	80. 4		[2] 133. 8			104. 1	178. 5
1917	100. 8		[2] 204. 3			115. 2	234. 2
1918	95. 0		[2] 160. 6			66. 8	227. 7
1919	90. 0		[2] 146. 3				[3] 212. 8
1920	109. 6						[3] 216. 5

[1] Bushels of 60 pounds. [2] Excludes Alsace-Lorraine. [3] England and Wales.

POTATOES—Continued.

TABLE 103.—*Potatoes: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.	Chicago cash price per bushel, fair to fancy.[1] December. Low.	December. High.	Following May. Low.	Following May. High.	Domestic exports, fiscal year beginning July 1.	Imports during fiscal year beginning July 1.
	Acres.	*Bush.*	*Bushels.*	*Cts.*	*Dollars.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Bushels.*	*Bushels.*
1849			*65,798,000*							155,595	
1859			*111,149,000*							380,372	
1866	1,069,000	100.2	107,201,000	47.3	50,723,000					512,380	198,265
1867	1,192,000	82.0	97,783,000	65.9	64,462,000					378,605	209,555
1868	1,132,000	93.8	106,090,000	59.3	62,919,000					508,249	138,470
1869	1,222,000	109.5	133,886,000	42.9	57,481,000					596,968	75,336
1869			*143,337,000*								
1870	1,325,000	86.6	114,775,000	65.0	74,621,000					553,070	458,758
1871	1,221,000	98.7	120,462,000	53.9	64,905,000					621,537	96,259
1872	1,331,000	85.3	113,516,000	53.5	60,692,000					515,306	346,840
1873	1,295,000	81.9	106,089,000	65.2	69,154,000					497,413	549,073
1874	1,310,000	80.9	105,981,000	61.5	65,223,000					609,642	188,757
1875	1,510,000	110.5	166,877,000	34.4	57,358,000					704,379	92,148
1876	1,742,000	71.7	124,827,000	61.9	77,320,000					529,650	3,205,555
1877	1,792,000	94.9	170,092,000	43.7	74,272,000					744,409	528,584
1878	1,777,000	69.9	124,127,000	58.7	72,924,000					625,342	2,624,149
1879	1,837,000	98.9	181,626,000	43.6	79,154,000					696,080	721,868
1879			*169,459,000*								
1880	1,843,000	91.0	167,660,000	48.3	81,062,000					638,840	2,170,372
1881	2,042,000	53.5	109,145,000	91.0	99,291,000					408,286	8,789,860
1882	2,172,000	78.7	170,973,000	55.7	95,305,000					439,443	2,362,362
1883	2,289,000	90.9	208,164,000	42.2	87,849,000					554,613	425,408
1884	2,221,000	85.8	190,642,000	39.6	75,524,000					380,868	658,633
1885	2,266,000	77.2	175,029,000	44.7	78,153,000			33	50	494,948	1,937,416
1886	2,287,000	73.5	168,051,000	46.7	78,442,000	44	47	65	90	434,864	1,432,490
1887	2,357,000	56.9	134,103,000	68.2	91,507,000	70	83	65	85	403,880	8,259,538
1888	2,533,000	79.9	202,365,000	40.2	81,414,000	30	37	24	45	471,955	883,380
1889	2,648,000	77.4	204,881,000	35.4	72,611,000	33	45	30	60	406,618	3,415,578
1889			*217,546,000*								
1890	2,652,000	55.9	148,290,000	75.8	112,342,000	82	93	95	110	341,189	5,401,912
1891	2,715,000	93.7	254,424,000	35.8	91,013,000	30	40	30	50	557,022	186,871
1892	2,548,000	61.5	156,655,000	66.1	103,568,000	60	72	70	98	845,720	4,317,021
1893	2,605,000	70.3	183,034,000	59.4	108,662,000	51	60	64	88	803,111	3,002,578
1894	2,738,000	62.4	170,787,000	53.6	91,527,000	43	58	40	70	572,957	1,341,533
1895	2,955,000	100.6	297,237,000	26.6	78,985,000	18	24	10	23	680,049	175,240
1896	2,767,000	91.1	252,235,000	28.6	72,182,000	18	26	19	26	926,646	246,178
1897	2,535,000	64.7	164,016,000	54.7	89,643,000	50	62	60	87	605,187	1,171,378
1898	2,558,000	75.2	192,306,000	41.4	79,575,000	30	36	33	52	579,833	530,420
1899	2,581,000	88.6	228,783,000	39.0	89,329,000	35	46	27	39	809,472	155,861
1899	*2,939,000*	*93.0*	*273,318,000*								
1900	2,611,000	80.8	210,927,000	43.1	90,811,000	40	48	35	60	741,483	371,911
1901	2,864,000	65.5	187,598,000	76.7	143,979,000	75	82	58	100	528,484	7,656,162
1902	2,966,000	96.0	284,633,000	47.1	134,111,000	42	48	42	60	843,075	358,505
1903	2,917,000	84.7	247,128,000	61.4	151,638,000	60	66	95	116	484,042	3,161,581
1904	3,016,000	110.4	332,830,000	45.3	150,673,000	32	38	20	25	1,163,270	186,199
1905	2,997,000	87.0	260,741,000	61.7	160,821,000	55	66	48	73	1,000,326	1,948,160
1906	3,013,000	102.2	308,038,000	51.1	157,547,000	40	43	55	75	1,530,461	176,917
1907	3,128,000	95.4	298,262,000	61.8	184,184,000	46	58	50	80	1,203,894	403,952
1908	3,257,000	85.7	278,985,000	70.6	197,039,000	60	77	70	150	763,651	8,383,966
1909	3,525,000	106.8	376,537,000								
1909	*3,669,000*	*106.1*	*389,195,000*	54.1	210,662,000	20	58	16	34	999,476	353,208
1910[2]	3,720,000	93.8	349,032,000	55.7	194,566,000	30	48	35	75	2,383,887	218,984
1911	3,619,000	80.9	292,737,000	79.9	233,778,000	70	100	90	200	1,237,276	13,734,695
1912	3,711,000	113.4	420,647,000	50.5	212,550,000	40	65	33	70	2,028,261	337,230
1913	3,668,000	90.4	331,525,000	68.7	227,903,000	50	70	60	90	1,794,073	3,645,993
1914	3,711,000	110.5	409,921,000	48.7	199,460,000	30	66	34	150	3,135,474	270,942
1915	3,734,000	96.3	359,721,000	61.7	221,992,000	53	95	80	110	4,017,760	209,532
1916	3,565,000	80.5	286,953,000	146.1	419,333,000	125	190	200	375	2,489,001	3,079,025
1917	4,384,000	100.8	442,108,000	122.8	542,774,000	93	135	[3] 80	[3] 250	3,453,307	1,180,480
1918	4,295,000	95.9	411,860,000	119.3	491,527,000	[3] 90	[3] 225	[3] 125	[3] 250	3,688,840	3,534,076
1919	3,952,000	90.0	355,773,000	160.6	571,368,000	[3] 280	[3] 360	[3] 685	[3] 925	3,724,234	6,940,930
1920	3,929,000	109.6	430,458,000	116.4	500,974,000	[3] 120	[3] 225				

[1] Burbank to 1910. [2] Figures adjusted to census basis. [3] Per 100 pounds.

POTATOES—Continued.

TABLE 104.—*Potatoes: Revised acreage, production, and farm value, 1889–1909.*

NOTE.—This revision for 1879 and 1889-1909 consists (1) in using the Department of Agriculture's estimate of average yield per acre to compute, from census acreage, the total production, (2) in adjusting the department's estimate of acreage for each year so as to be consistent with the following as well as the preceding census acreage, and (3) in recomputing total farm value from these revised production figures.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1889	*2,601,000*	77.4	201,200,000	35.4	71,294,000
1890	2,653,000	56.7	150,494,000	75.3	113,291,000
1891	2,732,000	93.7	256,122,000	35.6	91,229,000
1892	2,650,000	62.1	164,516,000	65.5	107,835,000
1893	2,722,000	71.7	195,040,000	58.4	113,886,000
1894	2,891,000	63.6	183,841,000	52.8	97,030,000
1895	3,101,000	102.3	317,114,000	26.2	83,151,000
1896	2,975,000	91.4	271,769,000	29.0	78,783,000
1897	2,813,000	67,9	191,025,000	54.2	103,442,000
1898	2,841,000	77.0	218,772,000	41.5	90,897,000
1899	*2,939,000*	88.6	260,257,000	39.7	103,365,000
1900	2,987,000	82.9	247,759,000	42.3	104,764,000
1901	2,996,000	66.3	198,626,000	76,3	151,602,000
1902	3,078,000	95.5	293,918,000	46.9	137,730,000
1903	3,080,000	85.1	262,053,000	60.9	159,620,000
1904	3,172,000	111.1	352,268,000	44.8	157,646,000
1905	3,195,000	87.3	278,885,000	61.1	170,340,000
1906	3,244,000	102.2	331,685,000	50.6	167,795,000
1907	3,375,000	95.7	322,954,000	61.3	197,863,000
1908	3,503,000	86.2	302,000,000	69.7	210,618,000
1909	*3,669,000*	107.5	394,553,000	54.2	213,679,000

POTATOES—Continued.

TABLE 105.—*Potatoes: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Dollars.*		*Acres.*	*Bushels.*	*Dollars.*
Maine	123	22,140	27,675	North Dakota	90	7,110	6,968
New Hampshire	15	1,950	2,022	South Dakota	84	8,904	8,637
Vermont	27	3,510	4,388	Nebraska	85	8,415	10,098
Massachusetts	32	4,000	6,000	Kansas	68	5,780	8,670
Rhode Island	3	345	552	Kentucky	65	6,435	9,652
Connecticut	24	2,760	4,140	Tennessee	43	3,569	5,710
New York	370	46,250	54,575	Alabama	48	3,216	6,432
New Jersey	95	14,820	18,525	Mississippi	16	1,392	2,784
Pennsylvania	317	36,455	45,204	Louisiana	27	1,755	3,563
Delaware	11	1,166	1,166	Texas	45	2,340	5,148
Maryland	60	6,120	5,814	Oklahoma	42	3,318	5,972
Virginia	126	13,608	12,928	Arkansas	31	2,418	4,232
West Virginia	57	6,840	9,234	Montana	46	5,060	5,313
North Carolina	56	5,040	7,157	Wyoming	27	3,375	4,050
South Carolina	31	3,100	5,580	Colorado	78	10,920	8,736
Georgia	22	1,628	3,386	New Mexico	5	475	998
Florida	25	2,625	5,250	Arizona	5	450	855
Ohio	115	11,500	15,525	Utah	17	3,298	2,638
Indiana	80	7,680	10,214	Nevada	6	1,032	1,610
Illinois	135	8,775	12,724				
				Idaho	41	7,380	5,018
Michigan	340	35,700	32,844	Washington	56	8,680	8,246
Wisconsin	308	33,264	28,607	Oregon	43	5,590	4,472
Minnesota	295	28,025	22,420	California	95	13,015	19,522
Iowa	104	11,440	13,957				
Missouri	95	7,790	11,763	United States	3,929	430,458	500,974

TABLE 106.—*Potatoes: Condition of crop, United States, on 1st of months named, 1899–1920.*

Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1899	93.8	93.0	86.3	81.7	1910	86.3	75.8	70.5	71.8
1900	91.3	88.2	80.0	74.4	1911	76.0	62.3	59.8	62.3
1901	87.4	62.3	52.2	54.0	1912	88.9	87.8	87.2	85.1
1902	92.9	94.8	89.1	82.5	1913	86.2	78.0	69.9	67.7
1903	88.1	87.2	84.3	74.6	1914	83.6	79.0	75.8	78.3
1904	93.9	94.1	91.6	89.5	1915	91.1	92.0	82.7	74.2
1905	91.2	87.2	80.9	74.3	1916	87.8	80.8	67.4	62.6
1906	91.5	89.0	85.3	82.2	1917	90.1	87.9	82.7	79.0
1907	90.2	88.5	80.2	77.0	1918	87.6	79.9	74.5	73.7
1908	89.6	82.9	73.7	68.7	1919	87.6	75.1	69.5	67.9
1909	93.0	85.8	80.9	78.8	1920	89.3	87.0	84.3	82.7

POTATOES—Continued.

TABLE 107.—*Potatoes: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911-1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911-1920.	1916	1917	1918	1919	1920	5-year average, 1915-1919.	1920
Me....	199	180	198	220	260	179	204	125	200	240	180	94	142	130	120	140	125	230.70	225.00
N. H..	124	125	140	122	159	95	120	107	140	105	130	119	166	167	145	175	155	170.98	201.50
Vt.....	122	105	140	127	168	108	112	100	130	100	130	103	139	140	138	157	125	143.91	162.50
Mass..	116	93	130	105	155	120	91	115	133	90	125	128	175	175	170	190	150	174.08	187.50
R. I...	118	110	113	130	165	110	74	135	130	100	115	131	185	175	173	180	160	175.85	184.00
Conn..	100	85	107	92	140	95	95	110	95	70	115	128	175	164	165	195	150	146.22	172.50
N. Y..	96	74	106	74	145	62	70	95	98	109	125	103	158	130	122	145	118	112.51	147.50
N. J...	109	73	108	95	108	130	122	114	92	96	156	115	155	141	170	169	125	153.20	195.00
Pa.....	89	56	109	88	105	72	70	92	80	100	115	108	148	135	151	154	124	111.32	142.60
Del....	88	60	100	87	80	95	90	95	87	83	106	101	125	130	140	125	100	106.56	106.00
Md....	89	45	112	87	78	97	95	100	80	94	102	94	133	119	120	130	95	104.74	96.90
Va....	94	45	87	94	65	125	130	99	94	95	108	101	137	125	120	157	95	128.01	102.60
W.Va.	91	45	112	83	54	117	88	115	87	90	120	116	158	132	160	175	135	132.72	162.00
N. C...	80	48	85	80	52	90	95	90	95	79	90	115	140	143	135	163	142	116.88	127.80
S. C...	85	70	90	80	70	80	75	96	102	85	100	156	175	210	193	200	180	158.34	180.00
Ga.....	71	72	78	81	60	65	60	84	70	70	74	149	175	195	185	217	208	122.91	153.92
Fla....	86	90	93	76	80	80	74	91	100	76	105	162	200	205	200	210	200	157.23	210.00
Ohio..	79	65	112	64	95	82	45	100	69	61	100	115	182	143	150	192	135	100.58	135.00
Ind....	76	58	114	53	80	95	44	92	80	44	96	111	177	139	135	195	133	90.55	127.68
Ill.....	70	50	101	46	60	110	58	90	72	52	65	118	179	152	148	196	145	102.80	94.25
Mich..	90	94	105	96	121	59	48	95	84	90	105	83	160	105	89	135	92	81.16	96.60
Wis...	103	116	120	109	124	87	47	114	110	94	108	77	147	90	80	140	86	86.09	92.88
Minn..	104	115	135	110	114	106	60	112	105	87	95	74	130	91	75	153	80	86.62	76.00
Iowa..	78	74	109	48	86	105	42	95	72	43	110	107	175	131	133	192	122	86.59	134.20
Mo....	66	27	84	38	45	98	60	87	61	75	82	120	180	137	153	184	151	103.46	123.82
N. Dak	91	120	128	85	109	90	93	43	99	63	79	80	115	130	73	160	98	74.56	77.42
S. Dak.	86	72	105	78	90	115	66	90	91	50	106	88	137	111	93	190	97	82.04	102.82
Nebr..	76	52	80	48	80	105	73	85	86	55	99	100	150	107	118	190	120	90.11	118.80
Kans..	63	22	82	40	62	83	71	57	53	76	85	122	165	152	144	190	150	97.19	127.50
Ky....	78	39	101	49	45	126	84	96	75	70	99	122	142	140	165	210	150	118.75	148.50
Tenn..	72	41	88	64	43	88	82	94	70	66	83	120	149	126	165	172	160	105.02	132.80
Ala....	79	78	81	84	79	80	90	72	80	80	67	145	169	182	181	215	200	134.39	134.00
Miss...	82	83	89	80	80	90	65	78	80	85	87	136	160	168	165	185	200	119.98	174.00
La.....	67	69	73	70	70	51	65	64	79	64	65	140	167	184	150	220	203	106.81	131.95
Tex...	59	57	63	52	61	65	50	60	55	73	52	158	190	210	200	210	220	110.51	114.40
Okla..	61	18	60	60	70	85	53	69	34	80	79	145	195	180	195	205	180	105.85	142.20
Ark...	70	55	70	72	60	90	65	80	50	81	78	139	190	157	184	205	175	115.11	136.50
Mont..	128	150	165	140	140	155	125	95	135	60	110	86	120	102	80	160	105	105.68	115.50
Wyo..	122	42	140	140	108	150	130	155	150	80	125	102	128	104	85	190	120	139.42	150.00
Colo...	122	35	95	115	120	135	138	160	160	120	140	88	135	91	99	170	80	153.71	112.00
N. Mex	91	80	100	68	100	100	102	116	100	45	95	140	175	165	160	190	210	142.08	199.50
Ariz...	96	95	125	75	110	95	115	105	85	70	90	154	180	150	205	195	190	154.05	171.00
Utah..	165	140	185	180	140	125	180	189	180	141	194	84	130	78	97	137	80	165.59	155.20
Nev...	169	160	178	160	130	172	190	207	171	150	172	104	130	120	123	150	156	210.23	268.32
Idaho..	164	180	185	170	155	125	150	156	185	155	180	75	127	79	81	151	68	153.53	122.40
Wash..	142	160	167	123	128	135	165	125	132	125	155	80	98	92	101	145	95	132.56	147.25
Oreg...	122	130	155	135	97	115	150	108	110	94	130	78	90	80	100	150	80	108.28	104.00
Calif...	135	135	130	119	138	130	141	145	143	130	137	110	140	150	120	171	150	181.26	205.50
U. S.	96.8	80.9	113.4	90.4	110.5	96.3	80.5	100.8	95.9	90.0	109.6	97.5	146.1	122.8	119.3	160.6	116.4	111.98	127.51

[1] Based upon farm price Dec. 1.

POTATOES—Continued.

TABLE 108.—*Potatoes: Stocks on Jan. 1.*

State and year.	Total production (000 omitted).	Stocks Jan. 1.		Per cent of crop held by—		Price per bushel.	
		Per cent of crop.	Bushels (000 omitted).	Growers.	Dealers.	Dec. 1.	Mar. 1.
Total United States:	*Bushels.*					*Cents.*	*Cents.*
1920–21	430, 458	33. 8	145, 286	85. 3	14. 7	116. 4	....
1919–20	355, 773	35. 7	127, 400	76. 9	23. 1	160. 6	243. 5
1918–19	411, 860	42. 5	174, 973	82. 6	17. 4	119. 3	109. 4
Total (21 Northern States):							
1920–21	306, 613	34. 7	106, 425	86. 3	13. 7	113	....
1919–20	249, 270	36. 4	90, 600	79. 5	20. 5	157	236
1918–19	281, 060	43. 5	122, 261	82. 4	17. 6	115	102
Total (11 Far West States):							
1920–21	59, 275	41. 8	24, 765	82. 6	17. 4	104	....
1919–20	48, 752	43. 1	21, 000	71. 6	28. 4	162	266
1918–19	66, 630	48. 0	31, 982	85. 3	14. 7	101	89
Total (16 Southern States):							
1920–21	64, 570	21. 8	14, 096	82. 1	17. 9	146	....
1919–20	57, 751	27. 5	15, 800	69. 1	30. 9	181	262
1918–19	64, 170	32. 3	20, 730	79. 5	20. 5	157	161
Maine:							
1920–21	22, 140	55. 0	12, 177	88. 0	12. 0	125	....
1919–20	25, 440	55. 0	13, 992	78. 0	22. 0	140	200
1918–19	22, 400	54. 0	12, 096	81. 0	19. 0	120	85
New York:							
1920–21	46, 250	47. 0	21, 738	91. 0	9. 0	118	....
1919–20	39, 567	48. 0	18, 992	90. 0	10. 0	145	220
1918–19	37, 240	50. 0	18, 620	92. 0	8. 0	122	105
Pennsylvania:							
1920–21	36, 455	33. 0	12, 030	91. 0	9. 0	118	....
1919–20	30, 800	30. 0	9, 240	90. 0	10. 0	145	220
1918–19	22, 000	42. 0	9, 240	92. 0	8. 0	122	105
Ohio:							
1920–21	11, 500	21. 0	2, 415	86. 0	14. 0	135	....
1919–20	7, 625	34. 0	2, 593	71. 0	29. 0	192	276
1918–19	11, 040	39. 0	4, 306	74. 0	26. 0	150	139
Indiana:							
1920–21	7, 680	12. 0	922	72. 0	28. 0	133	....
1919–20	3, 740	27. 0	1, 010	70. 0	30. 0	195	275
1918–19	8, 640	48. 0	4, 147	81. 0	19. 0	135	129
Illinois:							
1920–21	8, 775	12. 0	1, 053	75. 0	25. 0	145	....
1919–20	7, 280	29. 0	2, 111	76. 0	24. 0	196	280
1918–19	11, 520	34. 0	3, 917	74. 0	26. 0	148	138
Michigan:							
1920–21	35, 700	45. 0	16, 088	83. 0	17. 0	92	....
1919–20	27, 900	35. 0	9, 765	77. 0	23. 0	135	228
1918–19	28, 560	51. 0	14, 566	82. 0	18. 0	89	77
Wisconsin:							
1920–21	33, 264	48. 0	15, 967	88. 0	12. 0	86	....
1919–20	28, 388	36. 0	10, 220	78. 0	22. 0	140	227
1918–19	33, 440	51. 0	17, 054	80. 0	20. 0	80	76
Minnesota:							
1920–21	28, 025	37. 0	10, 369	80. 0	20. 0	60	....
1919–20	26, 970	33. 0	8, 900	76. 0	24. 0	153	237
1918–19	32, 760	42. 0	13, 759	76. 0	24. 0	75	63
North Dakota:							
1920–21	7, 110	20. 0	1, 422	62. 0	38. 0	98	....
1919–20	5, 985	21. 0	1, 257	86. 0	14. 0	160	243
1918–19	9, 108	42. 0	3, 825	86. 0	14. 0	73	83
Nebraska:							
1920–21	8, 415	28. 0	2, 356	85. 0	15. 0	120	....
1919–20	5, 720	36. 0	2, 059	78. 0	22. 0	190	275
1918–19	10, 406	37. 0	3, 850	76. 0	24. 0	118	135
Kentucky:							
1920–21	6, 435	29. 0	1, 866	66. 0	34. 0	150	....
1919–20	4, 900	41. 0	2, 009	61. 0	39. 0	210	269
1918–19	5, 625	52. 0	2, 925	75. 0	25. 0	165	151
Colorado:							
1920–21	10, 920	41. 0	4, 477	92. 0	8. 0	80	....
1919–20	11, 040	38. 0	4, 195	89. 0	11. 0	170	245
1918–19	15, 840	56. 0	8, 870	89. 0	11. 0	99	66
Idaho:							
1920–21	7, 380	48. 0	3, 542	90. 0	10. 0	68	....
1919–20	6, 045	41. 0	2, 478	63. 0	37. 0	151	253
1918–19	6, 290	58. 0	3, 648	86. 0	14. 0	81	59
Washington:							
1920–21	8, 680	49. 0	4, 253	89. 0	11. 0	95	....
1919–20	7, 250	55. 0	3, 988	75. 0	25. 0	145	259
1918–19	8, 316	62. 0	5, 156	89. 0	11. 0	101	75

POTATOES—Continued.

TABLE 109.—*Potatoes: Extent and causes of yearly losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	16.3	5.0	0.4	0.7	0.1	0.7	0.1	23.6	8.8	4.7	(1)	0.3	38.1
1918	14.7	1.0	.2	1.5	.1	.6	(1)	18.4	5.3	3.3	(1)	.2	28.3
1917	8.8	3.5	.2	3.0	.2	.3	(1)	16.3	4.1	2.4	(1)	.1	23.8
1916	19.7	6.5	.4	1.9	.2	1.4	.1	31.5	5.6	4.5	(1)	.2	43.6
1915	2.2	8.7	.5	2.2	.1	.1	.1	14.0	13.0	2.4	(1)	.1	30.4
1914	10.2	2.1	.1	.8	.1	.4	(1)	14.0	1.7	3.3	(1)	.3	21.2
1913	20.8	1.6	.2	2.0	.1	.7	(1)	26.0	1.7	3.9	0.1	.5	34.5
1912	5.3	3.3	.4	.6	.1	.2	.1	10.5	5.8	3.9	.2	.3	21.7
1911	25.8	2.0	(1)	1.9	.1	3.2	(1)	33.5	2.7	2.6	.1	.6	42.4
1910	15.4	1.7	.2	1.1	.1	.3	(1)	19.2	3.9	5.0	.1	.4	29.8
1909	11.3	2.8	.3	1.8	.2	.2	(1)	16.7	1.7	1.7	.1	.2	21.3
Average	14.4	3.1	.2	1.6	.1	.7	.1	20.7	4.4	3.2	.1	.3	30.0

[1] Less than 0.05 per cent.

TABLE 110.—*Potatoes: Farm price, cents per bushel on 1st of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	178.6	116.1	121.0	147.3	70.6	49.7	68.4	50.6	84.5	54.1	94.1
Feb. 1	217.6	114.4	122.9	172.4	88.0	50.4	69.7	53.1	94.4	55.1	103.8
Mar. 1	243.5	109.4	120.3	240.7	94.4	50.4	70.7	52.0	102.0	55.3	113.9
Apr. 1	295.6	105.4	92.6	234.7	97.6	47.8	70.0	50.3	117.1	55.5	116.7
May 1	393.6	118.9	80.1	279.6	94.8	50.5	71.4	48.2	127.3	62.5	133.7
June 1	421.3	121.4	75.5	274.0	98.8	50.8	71.3	55.2	119.7	63.3	135.1
July 1	386.0	128.4	94.9	247.9	102.3	52.1	81.5	49.8	103.6	96.3	134.3
Aug. 1	302.9	192.8	141.6	170.8	95.4	56.3	87.1	69.2	86.2	136.0	133.9
Sept. 1	184.9	187.5	148.8	139.1	109.3	50.5	74.9	75.3	65.0	113.7	114.9
Oct. 1	134.8	164.2	143.6	122.1	112.0	48.8	64.7	73.9	51.1	88.3	100.4
Nov. 1	118.3	152.8	127.2	127.8	135.7	60.8	52.8	69.6	45.5	76.3	96.7
Dec. 1	116.4	160.6	119.3	122.3	146.1	61.7	48.7	68.7	50.5	79.9	97.5
Average	202.5	149.3	121.8	164.9	114.1	54.4	64.4	64.3	72.5	80.6	108.8

POTATOES—Continued.

TABLE 111.—*Potatoes: Wholesale price, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York State and Western (per 180 pounds).			Chicago, fair to fancy (per bushel).			Minneapolis (per bushel).			St. Louis Burbank (per bushel).			Cincinnati (per bushel).			Denver (per 100 pounds).			San Francisco (per 100 pounds).		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1913.																					
January-June	$1.70	$2.87	....	$0.15	$0.70	....	$0.33	$0.60	....	$0.30	$0.87	....	$0.30	$1.00	....	$0.50	$1.00	....	$0.20	$1.65	....
July-December	1.75	2.37	....	.50	.82	....	.50	1.00	....	.45	.93	....	.65	1.00	....	.60	2.50	....	.50	1.25	....
1914.																					
January-June	2.00	3.00	....	.56	1.75	....	.55	1.35	....	.65	1.60	....	.65	1.15	....	1.00	2.50	....	.80	1.65	....
July-December	1.25	2.12	....	.28	1.65	....	.28	1.50	....	.33	1.50	....	.45	1.70	....	.90	2.75	....	.60	1.30	....
1915.																					
January-June	1.00	1.75	....	.18	.50	....	.30	.65	....	.38	.55	....	.30	.50	....	.90	2.25	....	1.00	3.50	....
July-December	1.75	3.00	....	.17		....	.25	1.00	....	.22	.96	....	.30	.90	....	.85	2.25	....	.85	1.50	....
1916.																					
January-June	2.85	3.90	....	.60	1.30	....	.62	1.35	....	.73	1.35	....	.65	1.30	....	1.40	5.00	....	.90	2.25	....
July-December	3.40	5.25	....	.65	2.00	....	.75	1.75	....	.50	2.10	....	.80	1.90	....	1.65	3.25	....	1.00	2.50	....
1917.																					
January-June	4.75	11.00	....	1.00	4.50	....	1.50	4.20	....	1.70	3.35	....	1.85	3.90	....	2.25	6.50	....	1.90	5.00	....
July-December	3.00	5.75	....	.90	2.85	....	.90	2.75	....	.87	1.70	....	1.10	2.75	....	2.00	4.25	....	1.25	....	....
1918.	*Per 100 pounds.*			*Per 100 pounds.*			*Per 100 pounds.*			*Per 100 pounds.*			*Per 100 pounds.*								
January-June	1.00	3.33	$2.02	.45	3.50	$1.69	.80	3.25	$1.64	.80	2.45	$1.57	....	....	....	.75	3.25	$2.05	1.00	2.00	$1.37
July-December	1.65	2.40	2.15	.85	3.25	2.01	1.50	3.25	2.08	1.07	2.85	1.41	....	....	....	1.00	3.65	2.85	1.25	2.75	2.00
1919.																					
January-June	[illegible]	6.00	4.42	.85	3.25	1.72	1.40	4.00	1.81	1.25	2.65	2.06	1.25	3.50	$2.22	1.40	7.00	2.38	1.50	3.00	1.99
July-December	[illegible]	7.25	3.26	1.50	5.50	3.06	2.20	4.50	2.91	1.50	4.50	2.90	2.65	7.50	5.36	1.50	5.00	2.98	1.75	4.25	2.37
1920.													*Per 150 pounds.*								
January	5.00	8.50	6.96	3.25	5.00	4.42	3.00	4.35	3.70	3.50	5.25	4.58	6.25	8.00	7.09	3.10	5.25	4.13	2.25	5.00	3.49
February	7.00	9.00	7.70	4.10	4.75	4.40	4.00	4.35	4.17	3.90	5.05	4.46	6.75	7.25	7.00	4.25	5.30	4.78	2.50	5.50	3.67
March	9.00	11.00	9.79	4.60	6.00	5.53	4.25	6.00	5.11	4.60	8.00	5.87	7.25	9.50	8.30	4.50	7.25	5.71	3.00	7.00	4.85
April	9.50	15.00	12.59	5.95	7.60	6.98	5.80	7.45	6.68	6.15	9.00	7.30	10.50	13.00	12.00	6.50	9.00	7.96	5.00	7.75	6.72
May	11.50	14.50	12.81	6.85	9.25	7.43	7.00	7.30	7.06	7.00	14.00	8.91	11.00	13.00	11.84	7.50	13.00	9.53	6.00	8.50	7.02
June	11.50	13.50	12.47	5.00	12.00	7.79	7.00	12.00	9.84	5.00	11.00	7.99	11.00	13.00	11.75	7.50	12.00	9.38	5.00	10.00	8.05
January-June	5.00	15.00	10.39	3.25	12.00	6.09	3.00	12.00	6.09	3.50	14.00	6.52	6.25	13.00	9.66	3.10	13.00	6.92	2.25	10.00	5.63
	Per 150 pounds.												*Per 100 pounds.*								
July	....	....	....	2.75	7.60	5.74	4.00	9.00	7.40	3.00	8.00	5.40	5.00	8.00	6.31	3.00	10.50	7.42	2.75	6.00	4.52
August	....	....	....	2.25	7.75	5.62	2.75	3.50	3.12	2.40	4.75	3.27	5.00	9.00	7.19	2.50	4.50	3.08	2.25	3.25	2.57
September	2.00	3.75	2.89	1.25	3.15	2.24	2.50	2.75	2.62	1.50	3.50	2.60	4.00	5.00	4.35	2.00	2.75	2.36	2.25	2.75	2.40
October	2.50	4.50	3.53	1.20	2.30	1.80	2.00	2.50	2.16	1.10	3.00	2.08	3.75	4.25	3.94	1.50	2.50	1.94	1.25	3.00	2.18
November	3.50	4.50	4.01	1.50	2.80	2.09	2.00	2.25	2.19	1.00	3.00	2.28	3.25	4.25	3.84	2.00	3.00	2.58	1.25	2.75	2.06
December	3.00	4.25	3.67	1.20	2.25	1.58	1.60	1.75	1.71	1.25	2.50	1.82	2.25	3.75	3.42	1.50	2.75	2.06	1.00	2.75	1.69
July-December	2.00	4.50	3.52	1.20	7.75	3.18	1.60	9.00	3.20	1.00	8.00	2.91	2.25	9.00	4.84	1.50	10.50	3.24	1.00	6.00	2.57

POTATOES—Continued.

TABLE 112.—*Potatoes: International trade, calendar years 1911–1919.*[1]

GENERAL NOTE.—Substantially the international trade of the world. It should not be expected that the world export and import totals for any year will agree. Among sources of disagreement are these: (1) Different periods of time covered in the "year" of the various countries; (2) imports received in year subsequent to year of export; (3) want of uniformity in classification of goods among countries; (4) different practices and varying degrees of failure in recording countries of origin and ultimate destination; (5) different practices of recording reexported goods; (6) opposite methods of treating free ports; (7) clerical errors, which, it may be assumed, are not infrequent.

The exports given are domestic exports, and the imports given are imports for consumption as far as it is feasible and consistent so to express the facts. While there are some inevitable omissions, on the other hand there are some duplications because of reshipments that do not appear as such in official reports. For the United Kingdom, import figures refer to imports for consumption, when available, otherwise total imports, less exports, of "foreign and colonial merchandise." Figures for the United States include Alaska, Porto Rico, and Hawaii.

EXPORTS.

Country.	Average, 1911–1913.	1914.	1915.	1916.	1917.	1918.	1919.
From—	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
Argentina	543	544	224	1,014	542	572	1,024
Austria-Hungary	1,451	....	....	....	....	....	....
Belgium	8,692	....	....	....	....	....	3,832
Canada	1,207	1,116	885	1,558	4,039	2,126	6,151
China	288	272	375	334	242	128	....
Denmark	928	769	117	692	31	1,703	....
France	8,683	3,976	3,865	1,819	1,099	611	1,327
Germany	12,412	....	....	....	....	....	....
Italy	3,975	6,303	391	2,066	583	148	505
Japan	440	396	383	454	385	326	....
Netherlands	16,451	15,234	8,819	8,040	2,273	465	13,549
Portugal	500	672	90	35	23	....	....
Russia	7,762	1,007	319	45	....	....	....
Spain	1,835	1,743	2,101	1,957	1,185	363	275
United Kingdom	6,246	1,893	1,231	1,346	339	2,532	....
United States	1,814	2,715	3,900	3,230	2,423	3,853	3,642
Other countries	1,924	870	1,541	1,520	1,434	772	....
Total	75,151	37,510	24,241	24,110	14,598	13,599	....

IMPORTS.

Country.	Average, 1911–1913.	1914.	1915.	1916.	1917.	1918.	1919.
Into—							
Algeria	1,218	1,079	979	680	573	373	538
Argentina	1,337	421	1,533	235	249	35	81
Austria-Hungary	4,070	....	....	....	....	....	....
Belgium	4,921	....	....	....	....	....	135
Brazil	939	697	322	167	43	16	43
Canada	525	664	348	573	463	728	616
Cuba	2,001	2,298	2,751	2,896	2,467	3,378	....
Egypt	599	351	400	353	359	5	163
Finland	479	409	412	109	....	....	....
France	7,143	8,745	1,330	2,577	970	1,069	11,691
Germany	29,180	....	....	....	....	....	....
Netherlands	1,952	1,312	79	2	1	1	108
Norway	215	174	61	488	(2)	412	....
Philippine Islands	334	311	317	305	287	239	....
Portugal	273	1,291	127	131	35	....	....
Russia	309	493	287	2	....	....	....
Sweden	700	452	9	(2)	112	1,256	732
Switzerland	3,172	4,873	1,117	2,857	1,259	140	94
United Kingdom	11,382	6,184	4,011	3,331	2,985	1,896	1,846
United States	5,707	800	236	886	3,182	1,201	5,544
Other countries	2,311	1,425	2,061	1,907	1,389	673	....
Total	78,767	31,979	10,383	17,499	14,374	11,422	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 bushels.

SWEET POTATOES.

TABLE 113.—*Sweet potatoes: Acreage, production, and value, in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Dec. 1.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
1849			*38,268,000*		
1859			*42,095,000*		
1869			*21,710,000*		
1879			*33,379,000*		
1889			*43,950,000*		
1899	*537,000*	*79.1*	*42,517,000*	*52.9*	*22,476,000*
1900	544,000	88.9	48,346,000	50.6	24,478,000
1901	547,000	81.7	44,697,000	57.5	25,720,000
1902	532,000	85.2	45,344,000	58.1	26,358,000
1903	548,000	89.2	48,870,000	58.3	28,478,000
1904	548,000	88.9	48,705,000	60.4	29,424,000
1905	551,000	92.6	51,034,000	58.3	29,734,000
1906	554,000	90.2	49,948,000	62.2	31,063,000
1907	565,000	88.2	49,813,000	70.0	34,858,000
1908	599,000	92.4	55,352,000	66.1	36,564,000
1909	*641,000*	*92.4*	*59,232,000*	69.4	41,052,000
1910	641,000	93.5	59,938,000	67.1	40,216,000
1911	605,000	90.1	54,538,000	75.5	41,202,000
1912	583,000	95.2	55,479,000	72.6	40,264,000
1913	625,000	94.5	59,057,000	72.6	42,884,000
1914	603,000	93.8	56,574,000	73.0	41,294,000
1915	731,000	103.5	75,639,000	62.1	46,980,000
1916	774,000	91.7	70,955,000	84.8	60,141,000
1917	919,000	91.2	83,822,000	110.8	92,916,000
1918	940,000	93.5	87,924,000	135.2	118,863,000
1919	1,042,000	101.2	105,405,000	133.5	140,706,000
1920	1,085,000	103.6	112,368,000	112.7	126,629,000

TABLE 114.—*Sweet potatoes: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Bushels.*	*Dollars.*		*Acres.*	*Bushels.*	*Dollars.*
New Jersey	14	2,002	3,103	Kansas	4	540	864
Pennsylvania	2	280	434	Kentucky	18	1,890	2,835
Delaware	8	1,021	1,024	Tennessee	42	4,284	5,269
Maryland	11	1,386	1,594	Alabama	180	17,460	17,460
Virginia	36	4,032	3,830				
				Mississippi	103	11,330	11,896
West Virginia	2	238	357	Louisiana	80	8,080	7,514
North Carolina	191	10,605	12,090	Texas	89	9,345	12,148
South Carolina	88	9,240	10,811	Oklahoma	24	2,760	3,643
Georgia	148	13,764	13,351				
Florida	45	4,275	5,130	Arkansas	49	5,145	5,402
				New Mexico	2	300	660
Ohio	1	103	180	Arizona	1	150	345
Indiana	3	360	576	California	8	1,056	1,690
Illinois	9	873	1,179				
Iowa	4	416	1,028	United States	1,085	112,368	126,629
Missouri	13	1,430	2,216				

SWEET POTATOES—Continued.

TABLE 115.—*Sweet potatoes: Condition of crop, United States, on 1st of months named, 1900–1920.*

Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.	Year.	July.	Aug.	Sept.	Oct.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1900....	93.7	92.2	83.6	80.0	1907....	85.9	85.7	85.7	82.7	1914....	77.1	75.5	81.8	80.7
1901....	93.1	80.7	78.7	79.0	1908....	89.8	88.8	88.7	85.5	1915....	88.7	85.5	87.5	85.0
1902....	83.6	78.3	77.2	79.7	1909....	89.7	86.9	81.3	77.8	1916....	90.4	85.9	82.7	79.2
1903....	90.2	88.7	91.1	83.7	1910....	87.3	85.4	83.9	80.2	1917....	81.9	84.8	85.7	83.2
1904....	87.3	88.5	89.9	86.1	1911....	78.4	77.7	79.1	78.1	1918....	86.4	78.3	74.5	77.4
1905....	90.6	90.1	89.5	88.6	1912....	86.9	85.0	84.1	82.0	1919....	90.1	87.1	86.0	83.9
1906....	90.9	91.2	88.7	86.0	1913....	86.5	85.8	81.4	80.1	1920....	87.2	86.9	86.8	87.1

TABLE 116.—*Sweet potatoes: Yield per acre, price per bushel Dec. 1, and value per acre, by States.*

State.	Yield per acre (bushels).											Farm price per bushel (cents).						Value per acre (dollars).[1]	
	10-year average, 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911–1920.	1916	1917	1918	1919	1920	5-year average, 1915–1919.	1920
N. J.....	125	130	120	138	100	155	100	120	115	125	143	127	120	160	190	220	155	182.80	221.65
Pa.......	117	121	120	110	105	105	100	110	120	138	140	123	135	140	185	180	155	167.63	217.00
Del......	127	140	120	135	120	135	125	112	.120	138	128	87	81	120	125	110	100	124.23	128.00
Md.......	128	115	125	141	125	130	126	118	130	140	126	92	88	100	150	133	115	140.22	144.90
Va.......	108	90	90	108	92	110	130	104	120	125	112	96	90	110	145	155	95	134.13	106.40
W. Va...	114	110	115	91	92	110	140	140	106	115	119	131	126	140	204	210	150	186.27	178.50
N. C.....	98	86	90	100	90	105	107	95	110	95	105	87	75	105	132	138	114	103.02	119.70
S. C.....	94	84	105	92	85	105	86	95	95	90	105	95	85	104	142	148	117	101.65	122.85
Ga.......	88	81	90	87	85	85	80	93	92	92	93	86	81	105	125	110	97	86.10	90.21
Fla......	106	108	112	110	120	112	100	95	110	100	95	96	86	115	125	140	120	109.78	114.00
Ohio.....	103	113	118	90	110	95	99	95	96	115	103	138	150	175	175	215	175	164.62	180.25
Ind......	105	114	116	78	100	104	100	106	108	105	120	135	150	165	195	215	160	170.97	192.00
Ill.......	91	89	98	70	84	110	90	97	82	95	97	125	125	150	175	175	135	131.59	130.95
Iowa....	93	105	90	80	100	95	91	90	93	80	104	171	192	210	210	250	247	172.32	256.88
Mo......	91	91	88	56	84	100	70	112	91	104	110	130	150	141	186	187	155	141.73	170.50
Kans....	95	75	99	50	110	110	92	92	80	109	135	143	150	160	222	185	160	154.89	216.00
Ky......	96	96	90	75	105	105	90	95	95	105	105	112	100	125	175	160	150	123.30	157.50
Tenn....	96	85	90	80	100	105	100	95	98	110	102	92	87	105	136	117	123	102.14	125.46
Ala......	93	97	100	95	93	90	74	90	96	94	97	82	74	92	115	113	100	81.10	97.00
Miss.....	94	85	97	98	90	110	82	65	95	105	110	79	67	97	104	112	105	78.98	115.50
La.......	87	90	84	85	87	92	90	79	75	90	101	82	66	104	128	115	93	77.41	93.93
Tex.....	86	71	75	80	101	98	89	78	58	110	105	114	90	140	175	150	130	104.88	136.50
Okla.....	92	75	92	64	102	115	74	90	65	130	11[illegible]	133	135	160	220	180	132	110.97	151.80
Ark......	99	92	88	90	95	130	91	110	90	100	105	93	90	96	138	115	105	101.20	110.25
N. Mex..	139	150	141	125	143	160	125	118	125	150	150	169	180	205	250	225	220	261.78	330.00
Ariz.....	157	200	140	135	200	150	160	150	135	150	150	191	185	227	238	250	230	311.56	345.00
Calif.....	153	140	156	170	161	135	160	167	170	135	132	121	100	150	150	179	160	203.03	211.20
U. S.	95.8	90.1	95.2	94.5	93.8	103.5	91.7	91.2	93.5	101.2	103.6	93.3	84.8	110.8	135.2	133.5	112.7	100.91	116.71

[1] Based upon farm price Dec. 1.

SWEET POTATOES—Continued.

TABLE 117.—*Sweet potatoes: Farm price, cents per bushel on 1st of each month, 1911-1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	138.2	142.1	117.2	90.1	64.9	79.0	79.2	80.4	83.0	75.0	94.9
Feb. 1	156.6	143.1	123.1	95.8	71.2	82.0	84.3	85.4	90.2	80.4	101.2
Mar. 1	172.2	153.7	142.7	110.7	77.3	84.7	86.7	88.9	98.0	84.4	109.9
Apr. 1	185.8	160.7	151.6	124.0	78.0	90.7	89.6	92.6	109.9	91.2	117.4
May 1	205.2	174.6	155.0	141.3	80.5	95.6	94.5	93.8	118.0	99.3	125.8
June 1	216.6	173.7	148.8	149.4	83.4	96.7	94.2	92.0	115.0	98.7	126.8
July 1	213.6	159.8	134.3	140.5	79.4	88.9	82.6	90.1	112.2	99.0	120.0
Aug. 1	223.5	167.9	144.7	129.3	87.1	85.8	97.5	94.1	107.8	105.8	124.3
Sept. 1	200.7	175.4	156.2	132.6	89.9	84.6	92.8	94.3	95.7	102.6	122.5
Oct. 1	160.8	154.7	160.6	116.1	83.7	72.7	87.3	83.9	84.4	91.8	109.6
Nov. 1	122.1	143.9	146.0	111.2	80.6	63.7	76.3	75.7	76.8	80.9	97.7
Dec. 1	112.7	133.5	135.2	110.8	84.8	62.1	73.0	72.6	72.6	75.5	93.3

TABLE 118.—*Sweet potatoes: Wholesale price per barrel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Baltimore.			St. Louis.			New Orleans.			New York.		
	All grades.			All grades (per bushel).			All grades.			Jersey and southern.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.												
January-June	$2.00	$3.50	......	$1.63	$3.75	......	$2.00	$2.00	......	$1.75	$3.00	.....
July-December	.75	7.00	......	.88	6.25	......	2.00	2.00	......	.40	5.50	.....
1914.												
January-June	1.00	2.50	......	1.50	2.50	......	1.00	3.20	......	.75	2.00	.....
July-December	1.00	5.50	......	1.75	4.50	......	.80	3.50	......	.75	5.00	......
1915.												
January-June	1.50	5.50	......	2.50	4.50	......	1.00	3.00	......	2.00	3.50	......
July-December	.75	6.50	......	1.50	3.40	......	.70	3.00	......	.50	5.00	......
1916.												
January-June	1.00	3.00	......	1.50	2.65	......	.50	1.70	......	1.00	2.50	......
July-December	1.25	5.50	......	2.00	3.25	......	.80	2.50	......	1.00	5.50	......
1917.												
January-June	2.75	6.00	......	.75	2.75	......	.65	2.25	......	2.50	5.25	......
July-December	.50	12.00	......	.40	2.50	......	.80	1.60	......	.50	9.00	......
1918.												
January-June	1.00	8.00	$5.02	.80	2.25	$1.79	2.00	7.00	$3.44	1.50	2.50	$2.00
July-December	2.50	10.00	5.88	.65	3.25	1.67	1.00	4.80	2.85	1.25	10.00	4.22
1919.												
January-June	4.00	11.00	7.85	1.25	4.25	2.40	1.00	5.50	3.08	5.00	8.50	6.02
July-December	2.25	12.00	4.27	.90	3.25	1.58	.75	3.25	1.80	1.50	5.25	2.97
1920.												
January	4.50	7.50	5.75	1.35	2.00	1.72	1.00	3.00	1.82	1.00	6.00	3.50
February	4.00	7.00	5.55	1.25	2.10	1.67	.75	3.25	1.93	2.00	6.00	3.83
March	3.00	8.00	5.47	1.50	2.40	1.93	.75	3.25	2.10	4.00	6.00	4.89
April	3.00	8.00	5.79	1.50	3.25	2.32	1.50	3.25	2.28	3.00	6.00	4.73
May	6.50	10.00	8.34	2.75	4.00	3.32	1.75	4.25	2.74	3.00	6.00	4.78
June	5.00	10.00	7.33	2.00	3.75	2.97	2.00	4.50	3.01	......	......	......
January-June	3.00	10.00	6.37	1.25	4.00	2.32	.75	4.50	2.31	1.00	6.00	4.33
July	......	......	......	......	......	......	2.25	7.00	4.07	......	......	......
August	5.00	14.00	7.92	1.00	4.00	2.60	1.50	7.00	3.12	6.00	10.50	8.14
September	2.50	7.00	4.02	1.00	3.00	1.73	1.25	3.00	2.03	1.25	9.50	4.84
October	2.50	4.00	3.01	1.00	1.50	1.14	.75	2.50	1.38	2.00	5.50	3.76
November	2.00	4.25	3.04	1.00	2.00	1.45	.75	2.25	1.43	2.00	3.50	2.15
December	2.00	4.75	3.18	1.00	2.00	1.61	.75	2.00	1.33	1.00	3.25	2.43
July-December	2.00	14.00	4.23	1.00	4.00	1.71	.75	7.00	2.23	1.00	10.50	8.92

HAY.

TABLE 119.—*Hay: Acreage, production, value, exports, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage (000 omitted).	Average yield per acre.	Production (000 omitted).	Average farm price per ton Dec. 1.	Farm value Dec. 1 (000 omitted).	Chicago prices No. 1 timothy per ton, by carload lots.				Domestic exports, fiscal year beginning July 1.	Imports, fiscal year beginning July 1.
						December.		Following May.			
						Low.	High.	Low.	High.		
	Acres.	*Tons.*[1]	*Tons.*[1]	*Dolls.*	*Dollars.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Tons.*[2]	*Tons.*[2]
1849			*13,839*								
1859			*19,084*								
1866	17,669	1.23	21,779	10.14	220,836					5,028	
1867	20,021	1.31	26,277	10.21	268,301					5,645	
1868	21,542	1.21	26,142	10.08	263,589						
1869	18,591	1.42	26,420	10.18	268,933					6,723	
1869			*27,316*								
1870	19,862	1.23	24,525	12.47	305,743					4,581	
1871	19,009	1.17	22,239	14.30	317,940					5,266	
1872	20,319	1.17	23,813	12.94	308,025					4,557	
1873	21,894	1.15	25,085	12.53	314,241					4,889	
1874	21,770	1.15	25,134	11.94	300,222					7,183	
1875	23,508	1.19	27,874	10.78	300,378					7,528	
1876	25,283	1.22	30,867	8.97	276,991			9.00	10.00	7,287	
1877	25,368	1.25	31,629	8.37	264,880	9.50	10.50	9.75	10.75	9,514	18,861
1878	26,931	1.47	39,608	7.20	285,016	8.00	8.50	9.00	11.50	8,127	10,320
1879	27,485	1.29	35,493	9.32	330,804	14.00	14.50	14.00	15.00	13,739	66,008
1879	*30,631*	*1.15*	*35,151*								
1880	25,864	1.23	31,925	11.65	371,811	15.00	15.50	17.00	19.00	12,662	174,281
1881	30,889	1.14	35,135	11.82	415,131	16.00	16.50	15.00	16.50	10,570	86,029
1882	32,340	1.18	38,138	9.73	371,170	11.50	12.25	12.00	13.00	13,309	97,574
1883	35,516	1.32	46,864	8.19	383,834	9.00	10.00	12.50	17.00	16,908	118,955
1884	38,572	1.26	48,470	8.17	396,139	10.00	11.50	15.50	17.50	11,142	160,950
1885	39,850	1.12	44,732	8.71	389,753	11.00	12.00	10.00	12.00	13,390	92,118
1886	36,502	1.15	41,796	8.46	353,438	9.50	10.50	11.00	12.50	13,873	78,368
1887	37,665	1.10	41,454	9.97	413,440	13.50	14.50	17.00	21.00	18,198	100,269
1888	38,592	1.21	46,643	8.76	408,500	11.00	11.50	10.50	21.00	21,928	105,395
1889	52,949	1.26	66,831	7.04	470,394	9.00	10.00	9.00	14.00	36,274	124,544
1889	*52,949*	*1.26*	*66,831*								
1890	50,713	1.19	60,198	7.87	473,570	9.00	10.50	12.50	15.50	28,066	58,242
1891	51,044	1.19	60,818	8.12	494,114	12.50	15.00	13.50	14.00	35,201	79,715
1892	50,853	1.18	59,824	8.20	490,428	11.00	11.50	12.00	13.50	33,084	104,257
1893	49,613	1.33	65,766	8.68	570,883	10.00	10.50	10.00	10.50	54,446	86,784
1894	48,321	1.14	54,874	8.54	468,578	10.00	11.00	10.00	10.25	47,117	201,900
1895	14,206	1.06	47,079	8.35	393,186	12.00	12.50	11.50	12.00	59,052	302,652
1896	43,260	1.37	59,282	6.55	388,146	8.00	8.50	8.50	9.00	61,658	119,942
1897	42,427	1.43	60,665	6.62	401,391	8.00	8.50	9.50	10.50	81,827	3,887
1898	42,781	1.55	66,377	6.00	398,061	8.00	8.25	9.50	10.50	64,916	19,872
1899	41,328	1.37	56,656	7.27	411,926	10.50	11.50	10.50	12.50	72,716	143,890
1899	*43,127*	*1.25*	*53,828*								
1900	39,133	1.28	50,111	8.89	445,539	11.50	14.00	12.50	13.50	89,364	142,620
1901	39,391	1.28	50,591	10.01	506,192	13.00	13.50	12.50	13.50	153,431	48,415
1902	39,825	1.50	59,858	9.06	542,036	12.00	12.50	13.50	15.00	50,974	293,112
1903	39,934	1.54	61,306	9.07	556,276	10.00	12.00	12.00	15.00	60,730	114,388
1904	39,999	1.52	60,696	8.72	529,108	10.50	11.50	11.00	12.00	66,557	46,214
1905	39,362	1.54	60,532	8.52	515,960	10.00	12.00	11.50	12.50	70,172	68,540
1906	42,476	1.35	57,146	10.37	592,540	15.50	18.00	15.50	20.50	58,602	61,116
1907	44,028	1.45	63,677	11.68	743,507	13.00	17.50	13.00	14.00	77,281	10,063
1908	45,970	1.52	70,050	9.02	631,683	11.50	12.00	12.00	13.00	64,641	6,712
1909	45,744	1.42	64,938								96,829
1909	*51,041*	*1.35*	*68,833*	10.49	722,385	16.00	17.00	12.50	16.00	55,007	
1910[3]	51,015	1.36	69,378	12.14	842,252	16.00	19.00	18.50	23.50	55,223	336,757
1911	48,240	1.14	54,916	14.29	784,926	20.00	22.00	24.00	28.00	59,730	699,004
1912	49,530	1.47	72,691	11.79	856,695	13.00	18.00	14.00	16.50	60,720	156,323
1913	48,954	1.31	64,116	12.43	797,077	14.50	18.00	15.00	17.50	50,151	170,786
1914	49,145	1.43	70,071	11.12	779,068	15.00	16.00	16.50	17.50	105,508	20,187
1915	51,108	1.68	85,920	10.63	913,644	14.50	16.50	17.50	20.00	178,336	43,184
1916	55,721	1.64	91,192	11.22	1,022,930	15.00	17.50	19.00	22.00	85,529	58,147
1917	55,203	1.51	83,308	17.09	1,423,766	26.00	28.00	20.00	26.00	30,145	410,738
1918	55,755	1.37	76,660	20.13	1,543,494	29.00	31.00	34.00	37.00	28,898	277,448
1919	56,552	1.62	91,883	20.09	1,846,083	28.00	32.00	35.00	50.00	60,802	324,952
1920	57,915	1.57	91,193	17.70	1,613,896	26.00	32.00				

[1] 2,000 pounds. [2] 2,240 pounds. [3] Figures adjusted to census basis.

HAY—Continued.

TABLE 120.—*Hay: Revised acreage, production, and farm value, 1879 and 1889–1909.*

[See headnote to Table 104.]

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per ton Dec. 1.	Farm value Dec. 1.
	Acres.	*Tons.*	*Tons.*	*Dollars.*	*Dollars.*
1879	*30, 631, 000*	1.30	39, 862, 000	9.31	371, 045, 000
1889	39, 004, 000	1.26	49, 181, 000	7.76	381, 481, 000
1890	40, 038, 000	1.23	49, 057, 000	8.18	401, 111, 000
1891	41, 258, 000	1.18	48, 759, 000	8.89	433, 276, 000
1892	42, 191, 000	1.17	49, 238, 000	8.95	440, 710, 000
1893	42, 413, 000	1.31	55, 575, 000	9.48	527, 044, 000
1894	42, 772, 000	1.18	50, 468, 000	8.96	452, 079, 000
1895	40, 832, 000	1.02	41, 838, 000	9.46	395, 647, 000
1896	40, 978, 000	1.33	54, 380, 000	7.48	406, 957, 000
1897	41, 336, 000	1.42	58, 878, 000	7.28	428, 919, 000
1898	43, 120, 000	1.55	66, 772, 000	6.63	442, 905, 000
1899	*43, 127, 000*	1.33	57, 450, 000	8.20	470, 844, 000
1900	42, 070, 000	1.27	53, 231, 000	9.72	517, 399, 000
1901	42, 066, 000	1.33	55, 819, 000	9.91	553, 328, 000
1902	42, 962, 000	1.52	65, 296, 000	9.19	599, 781, 000
1903	43, 400, 000	1.57	68, 154, 000	9.35	637, 485, 000
1904	44, 645, 000	1.55	69, 192, 000	8.91	616, 369, 000
1905	45, 991, 000	1.59	72, 973, 000	8.59	627, 023, 000
1906	47, 891, 000	1.39	66, 341, 000	10.43	692, 116, 000
1907	49, 098, 000	1.47	72, 261, 000	11.78	850, 915, 000
1908	51, 196, 000	1.53	78, 440, 000	9.14	716, 644, 000
1909	*51, 041, 000*	1.46	74, 384, 000	10.58	786, 722, 000

TABLE 121.—*Hay: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Tons.*	*Dollars.*		*Acres.*	*Tons.*	*Dollars.*
Maine	1, 168	1, 191	29, 299	North Dakota	715	894	8, 851
New Hampshire	450	540	13, 500	South Dakota	1, 000	1, 750	14, 875
Vermont	910	1, 320	30, 360	Nebraska	1, 619	4, 209	37, 881
Massachusetts	436	610	17, 080	Kansas	1, 780	3, 702	37, 760
Rhode Island	46	51	1, 693	Kentucky	1, 093	1, 497	32, 934
Connecticut	355	462	13, 860	Tennessee	1, 430	2, 002	41, 041
New York	4, 386	5, 482	129, 375	Alabama	1, 445	1, 329	25, 916
New Jersey	330	544	14, 960	Mississippi	417	709	12, 195
Pennsylvania	2, 822	3, 951	92, 848	Louisiana	280	490	7, 840
Delaware	86	120	2, 580	Texas	662	1, 092	14, 633
Maryland	472	732	18, 300	Oklahoma	730	1, 752	18, 396
Virginia	950	1, 235	29, 022	Arkansas	660	957	15, 312
West Virginia	800	1, 000	24, 200	Montana	842	1, 516	18, 192
North Carolina	897	1, 310	30, 130	Wyoming	740	1, 850	22, 200
South Carolina	450	450	11, 250	Colorado	1, 236	2, 966	35, 592
Georgia	660	759	17, 836	New Mexico	240	600	10, 200
Florida	115	132	2, 508	Arizona	123	381	11, 049
Ohio	3, 150	4, 252	82, 914	Utah	472	1, 265	16, 445
Indiana	2, 205	2, 844	54, 889	Nevada	200	486	7, 776
Illinois	3, 264	4, 080	84, 048				
				Idaho	750	2, 250	28, 125
Michigan	2, 624	3, 149	66, 129	Washington	810	1, 620	29, 970
Wisconsin	2, 832	4, 814	98, 206	Oregon	900	2, 160	31, 320
Minnesota	2, 020	3, 434	38, 461	California	2, 175	5, 002	100, 010
Iowa	3, 021	4, 350	70, 644				
Missouri	3, 147	3, 902	61, 261	United States	57, 915	91, 193	1, 613, 896

HAY—Continued.

TABLE 122.—*Hay: Yield per acre, price per ton Dec. 1, and value per acre, by States.*

State.	Average yield per acre (tons). 10-year average 1911-1920.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	Farm price per ton (dollars). 10-year average 1911-1920.	1916.	1917.	1918.	1919.	1920.	Value per acre (dollars).[1] 5-year average 1915-1919.	1920.
Me	1.18	1.10	1.16	1.00	1.15	1.15	1.45	1.35	1.15	1.30	1.02	15.07	12.40	11.10	13.90	18.70	24.60	18.08	25.09
N. H	1.19	1.05	1.25	1.00	1.15	1.00	1.45	1.35	1.15	1.30	1.20	17.81	14.50	12.00	18.80	24.00	25.00	21.49	30.00
Vt	1.44	1.30	1.50	1.28	1.20	1.35	1.70	1.62	1.30	1.70	1.45	15.61	12.60	11.50	16.30	20.10	23.00	23.27	33.35
Mass	1.35	1.08	1.25	1.21	1.32	1.50	1.50	1.56	1.20	1.50	1.40	22.90	19.00	19.90	26.00	27.00	28.00	32.84	39.20
R. I	1.23	1.00	1.13	1.17	1.17	1.24	1.35	1.50	1.30	1.30	1.10	24.12	20.00	20.30	25.50	32.00	33.20	32.02	36.52
Conn	1.31	1.10	1.15	1.14	1.25	1.35	1.55	1.50	1.30	1.50	1.30	22.78	18.50	19.50	24.00	30.20	30.00	32.29	39.00
N. Y	1.30	1.02	1.25	1.14	1.20	1.30	1.62	1.46	1.25	1.50	1.25	16.99	11.90	15.10	20.40	20.50	23.60	23.60	29.50
N. J	1.43	1.05	1.44	1.30	1.35	1.45	1.60	1.45	1.50	1.50	1.65	22.17	17.60	20.00	28.00	29.10	27.50	34.07	45.38
Pa	1.37	1.00	1.43	1.32	1.28	1.40	1.60	1.41	1.41	1.45	1.40	18.31	13.80	17.50	23.70	24.00	23.50	27.36	32.90
Del	1.24	.88	1.33	1.30	1.10	1.20	1.45	1.26	1.25	1.28	1.40	19.91	15.90	20.50	28.00	26.00	21.50	27.51	30.10
Md	1.29	.72	1.51	1.26	1.15	1.20	1.48	1.25	1.35	1.40	1.55	19.32	14.00	19.90	26.80	24.00	25.00	26.96	38.75
Va	1.18	.64	1.20	1.27	.72	1.35	1.35	1.16	1.35	1.50	1.30	19.06	15.00	21.30	23.00	23.70	23.50	26.55	30.55
W. Va	1.26	.66	1.38	1.25	.92	1.50	1.54	1.27	1.30	1.50	1.25	19.10	14.50	21.10	23.50	25.60	24.20	28.12	30.25
N. C	1.32	1.05	1.30	1.31	1.15	1.85	1.30	1.13	1.20	1.40	1.46	18.92	17.50	19.70	21.00	24.20	23.00	26.92	33.58
S. C	1.11	1.08	1.15	1.16	1.15	1.30	1.30	1.08	1.10	.75	1.00	20.57	16.70	20.60	26.10	31.00	25.00	23.24	25.00
Ga	1.23	1.35	1.35	1.40	1.35	1.15	1.15	1.03	1.24	1.10	1.15	19.17	16.20	20.00	23.50	25.30	23.50	22.71	27.02
Fla	1.23	1.30	1.25	1.35	1.35	1.20	1.25	1.10	1.14	1.25	1.15	18.27	16.00	18.20	18.50	23.00	19.00	21.81	21.85
Ohio	1.33	.98	1.36	1.30	1.13	1.44	1.57	1.42	1.40	1.38	1.35	16.39	10.60	19.00	22.20	21.80	19.50	24.61	26.32
Ind	1.27	.94	1.37	1.00	1.00	1.50	1.44	1.45	1.45	1.22	1.29	15.77	10.90	18.70	19.80	21.60	19.30	22.88	24.90
Ill	1.23	.82	1.30	.98	.85	1.54	1.45	1.25	1.35	1.48	1.25	16.32	11.30	20.00	21.00	21.40	20.60	23.61	25.75
Mich	1.28	1.16	1.33	1.05	1.28	1.40	1.70	1.50	1.03	1.20	1.20	16.21	10.00	17.20	23.50	23.40	21.00	22.45	25.20
Wis	1.62	1.20	1.60	1.62	1.75	1.75	1.70	1.70	1.40	1.77	1.70	14.92	11.60	17.30	21.60	20.30	20.40	26.52	34.68
Minn	1.62	1.00	1.53	1.50	1.89	1.91	1.85	1.55	1.40	1.90	1.70	9.63	7.00	12.10	14.10	14.50	11.20	18.24	19.04
Iowa	1.41	.80	1.40	1.48	1.38	1.80	1.60	1.23	1.30	1.65	1.44	12.80	9.00	16.80	18.20	17.40	16.24	20.62	23.39
Mo	1.07	.60	1.30	.60	.70	1.52	1.30	1.15	.90	1.35	1.24	14.22	9.30	17.50	20.50	19.50	15.70	17.98	19.47
N. Dak	1.30	1.10	1.40	1.14	1.45	1.50	1.70	.88	1.10	1.50	1.25	8.53	6.00	11.50	14.60	14.10	9.90	13.22	12.38
S. Dak	1.54	.55	1.46	1.20	1.70	2.00	1.90	1.50	1.60	1.75	1.75	8.01	5.40	10.60	10.00	13.50	8.50	15.28	14.88
Nebr	1.80	.85	1.35	1.34	1.69	2.60	2.10	1.60	1.40	2.43	2.60	10.20	7.10	15.20	17.20	14.00	9.00	22.48	23.40
Kans	1.71	.85	1.50	.90	1.41	2.30	1.55	2.18	1.73	2.46	2.08	11.26	7.60	16.60	19.40	15.80	10.20	26.66	21.22
Ky	1.22	.95	1.23	.87	.95	1.40	1.40	1.30	1.30	1.40	1.37	18.00	12.60	20.30	23.70	25.40	22.00	25.58	30.14
Tenn	1.28	1.00	1.30	1.21	1.20	1.47	1.38	1.20	1.35	1.33	1.40	18.54	15.00	19.30	24.00	27.00	20.50	26.52	28.70
Ala	1.14	1.40	1.25	1.36	1.31	1.45	1.10	.80	.81	1.00	.92	15.91	13.00	16.20	20.30	22.30	19.50	16.80	17.94
Miss	1.45	1.50	1.48	1.33	1.45	1.40	1.40	1.45	1.20	1.60	1.70	14.25	11.00	15.30	18.50	20.50	17.20	21.60	29.24
La	1.62	1.30	1.65	1.50	1.90	1.75	1.70	1.60	1.30	1.80	1.75	14.50	11.00	14.30	21.20	23.00	16.00	25.71	28.00
Tex	1.38	1.00	1.40	1.16	1.75	1.70	1.20	1.00	1.00	1.90	1.65	13.86	10.50	20.00	24.90	18.00	13.40	21.03	22.11
Okla	1.54	.80	1.25	.85	1.13	2.30	1.70	1.60	1.20	2.20	2.40	10.88	9.00	15.40	19.50	15.10	10.50	21.89	25.20
Ark	1.31	1.15	1.23	1.20	1.05	1.60	1.25	1.47	1.30	1.40	1.45	14.56	12.50	15.40	19.50	20.50	16.00	21.76	23.20
Mont	1.77	2.00	1.90	1.80	2.50	2.00	1.70	1.40	1.60	1.00	1.80	12.83	11.00	18.60	19.60	23.00	12.00	22.82	21.60
Wyo	1.99	2.10	1.90	1.90	2.30	2.20	1.80	1.70	2.10	1.40	2.50	11.89	12.00	17.00	14.00	23.00	12.00	25.85	30.00
Colo	2.22	2.00	2.19	2.05	2.40	2.20	2.05	2.45	2.22	2.25	2.40	11.66	11.00	16.00	15.50	18.50	12.00	31.19	28.80
N. Mex	2.31	2.60	2.33	2.08	2.50	2.20	2.00	1.90	2.20	2.75	2.50	14.19	14.00	21.00	20.00	18.20	17.00	36.26	42.50
Ariz	2.53	3.86	3.40	4.00	3.20	3.20	3.80	3.50	3.20	4.00	3.10	16.57	14.50	24.80	24.00	20.00	29.00	65.88	89.90
Utah	2.51	2.50	2.78	2.33	2.75	2.50	2.20	2.90	2.35	2.07	2.68	12.38	15.00	15.00	17.10	21.90	13.00	36.40	34.84
Nev	2.81	3.40	3.00	2.75	3.25	3.00	2.40	2.90	2.60	2.34	2.43	12.60	9.60	15.90	19.90	19.60	16.00	37.85	38.88
Idaho	2.82	3.10	2.80	2.90	2.65	2.70	2.50	3.00	3.00	2.50	3.00	11.63	12.10	16.00	17.60	22.00	12.50	41.37	37.50
Wash	2.22	2.40	2.20	2.30	2.20	2.30	2.40	2.20	1.80	2.40	2.00	15.55	13.80	20.00	25.40	23.00	18.50	40.58	37.00
Oreg	2.10	2.10	2.20	2.10	2.00	2.20	2.30	1.95	1.80	1.90	2.40	12.76	10.90	[illegible]	20.00	19.10	14.50	30.48	34.80
Calif	1.81	1.75	1.53	1.50	1.95	1.80	1.75	2.00	1.25	2.25	2.30	14.65	12.60	19.20	20.00	17.20	20.00	28.86	46.00
U. S.	1.47	1.14	1.47	1.31	1.43	1.68	1.64	1.51	1.37	1.62	1.57	14.65	11.22	17.09	20.13	20.09	17.70	24.47	27.87

[1] Based upon farm price Dec. 1.

HAY—Continued.

TABLE 123.—*Hay: Stocks on farms May 1.*

Year.	Production of all hay preceding year (tons).	Per cent on farms May 1.	Tons on farms May 1.	Price per ton May 1.
1910	87,216,000	11.5	10,053,000	$11.08
1911	82,529,000	12.4	10,222,000	11.69
1912	67,071,000	8.5	5,732,000	16.31
1913	90,734,000	14.9	13,523,000	10.42
1914	79,179,000	12.2	9,631,000	11.63
1915	88,686,000	12.2	10,797,000	11.03
1916	107,263,000	13.5	14,452,000	11.27
1917	110,992,000	11.4	12,659,000	13.94
1918	98,439,000	11.7	11,476,000	17.97
1919	91,139,000	9.4	8,559,000	22.31
1920	109,152,000	10.4	11,345,000	24.22

TABLE 124.—*Hay: Farm price per ton on 1st of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	$20.55	$19.92	$18.09	$10.86	$10.07	$10.47	$11.70	$11.11	$13.75	$11.69	$13.82
Feb. 1	21.76	19.79	18.88	11.34	10.55	10.83	11.67	10.86	14.39	11.80	14.19
Mar. 1	22.31	19.82	19.14	11.54	10.75	10.89	11.69	10.61	14.66	11.57	15.30
Apr. 1	22.94	20.52	18.68	12.53	10.85	10.98	11.52	10.43	15.64	11.36	14.54
May 1	24.22	22.31	17.97	13.94	11.27	11.03	11.63	10.42	16.31	11.69	15.08
June 1	24.85	23.30	17.13	14.68	11.47	11.16	11.64	10.55	16.22	12.38	15.34
July 1	23.62	21.73	16.07	13.96	11.10	10.85	11.29	10.47	14.32	13.19	14.66
Aug. 1	20.89	20.16	15.92	12.90	9.89	10.19	10.76	10.43	12.03	13.83	13.70
Sept. 1	19.88	20.52	17.42	13.26	9.72	9.95	11.10	11.04	11.21	11.63	13.77
Oct. 1	18.94	19.79	18.45	13.83	9.65	9.83	10.96	11.45	11.02	13.53	13.74
Nov. 1	17.45	19.36	19.27	15.16	9.99	9.98	10.78	11.51	11.08	13.61	13.82
Dec. 1	17.70	20.09	20.13	17.09	11.22	10.63	11.12	12.43	11.79	14.29	14.65
Average	20.85	20.45	18.10	13.53	10.48	10.50	11.28	11.02	13.24	12.83	14.23

TABLE 125.—*Hay: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
1919	9.9	1.9	0.3	1.0	0.1	0.4	0.1	13.9	0.1	1.0	(1)	0.1	15.5
1918	17.5	.7	.2	2.7	.1	.8	.1	22.7	.1	.9	0.1	(1)	24.9
1917	11.5	1.3	.2	2.9	.2	.3	.1	16.8	.1	.4	.1	(1)	18.3
1916	5.5	1.0	.3	1.1	.1	.2	.1	8.6	(1)	.3	(1)	(1)	9.6
1915	3.7	4.9	.6	1.8	.1	.1	.3	11.9	.2	.5	.1	(1)	13.0
1914													
1913													
1912													
1911	27.7	.8	(1)	.9	.1	1.9	(1)	31.9	.1	.6	.1	.1	34.7
1910	17.4	1.2	.3	1.2	.1	.5	.1	21.2	.1	.5	.2	.1	23.6
1909	10.7	2.2	.6	1.2	.1	.3	.3	15.7	.1	.5	.1	.1	17.6
Average	13.4	1.7	.3	1.7	.1	.6	.2	18.4	.1	.5	.1	.1	20.4

[1] Less than 0.05 per cent.

HAY—Continued.

TABLE 126.—*Timothy and clover hay: Farm price per ton, 15th of each month, 1916–1920.*

Date.	Timothy.					Clover.				
	1920	1919	1918	1917	1916	1920	1919	1918	1917	1916
Jan. 15	$24.59	$23.48	$21.37	$12.61	$13.11	$23.78	$21.69	$19.82	$11.38	$11.24
Feb. 15	25.49	22.69	22.25	12.91	13.39	24.94	21.11	21.11	11.65	11.41
Mar. 15	26.75	22.68	22.53	13.20	13.61	26.13	21.25	21.37	11.90	11.70
Apr. 15	27.99	24.74	21.47	14.26	14.00	26.93	23.36	19.68	13.06	11.87
May 15	29.92	27.27	20.40	15.31	14.50	28.31	25.33	18.30	13.94	12.52
June 15	30.05	27.50	18.55	15.76	14.71	27.80	25.48	16.54	14.22	12.46
July 15	26.59	24.22	17.61	14.68	12.97	24.62	22.02	15.73	12.95	10.84
Aug. 15	24.35	23.89	18.98	14.11	11.74	22.82	21.58	17.18	12.76	9.93
Sept. 15	24.15	23.65	20.85	14.89	11.57	22.57	21.74	19.27	13.79	10.01
Oct. 15	22.74	23.04	22.60	16.23	11.54	21.29	21.17	20.60	15.01	10.08
Nov. 15	22.09	22.90	22.93	18.33	12.03	20.60	21.61	21.13	17.14	10.46
Dec. 15	21.22	23.71	22.94	20.31	12.29	19.96	22.60	21.26	18.67	10.86

TABLE 127.—*Alfalfa and prairie hay: Farm price per ton, 15th of each month, 1916–1920.*

Date.	Alfalfa.					Prairie.				
	1920	1919	1918	1917	1916	1920	1919	1918	1917	1916
Jan. 15	$24.13	$20.42	$21.27	$12.79	$9.89	$17.54	$16.33	$15.39	$8.58	$7.38
Feb. 15	24.41	20.91	21.38	13.63	10.35	17.36	16.55	15.74	8.60	7.34
Mar. 15	24.68	21.40	20.82	14.68	10.74	16.52	17.38	15.47	9.32	7.39
Apr. 15	24.57	22.28	18.97	17.68	10.73	16.66	18.85	14.47	10.94	7.56
May 15	25.68	23.32	17.84	17.92	10.56	18.06	20.22	12.75	12.02	7.71
June 15	24.20	20.89	16.74	16.77	10.49	17.59	18.71	12.78	11.84	7.97
July 15	21.70	20.15	16.58	14.13	9.87	15.38	16.10	12.51	10.11	7.25
Aug. 15	20.43	20.72	18.22	15.28	9.80	13.74	16.10	13.26	10.82	6.96
Sept. 15	19.12	20.89	19.72	16.33	10.06	12.93	15.90	14.35	11.40	7.21
Oct. 15	18.03	20.56	20.23	17.59	10.25	11.83	15.88	15.06	12.29	7.26
Nov. 15	12.88	21.63	20.42	19.19	11.37	11.47	16.91	15.47	13.32	7.85
Dec. 15	16.59	22.95	20.74	20.39	12.31	10.80	17.19	16.30	14.91	8.14

HAY—Continued.

TABLE 128.—*Hay: Wholesale price (baled) per ton, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago.			Cincinnati.			St. Louis.			New York.			San Francisco.		
	No. 1 timothy.			No. 1 timothy.			No. 1 timothy.[1]			No. 1 timothy.			No. 1 wheat; light bales.[2]		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
January-June	13.00	18.00	15.15	13.50	19.00	16.42	12.00	17.50	17.57	19.50	23.00	20.93	.....	.....	.....
July-December	13.50	19.50	16.50	15.00	21.00	18.89	14.50	22.50	18.10	20.00	22.00	21.09	.....	.....	.....
1914.															
January-June	13.50	17.50	15.62	17.50	21.00	18.91	15.00	23.00	19.24	19.50	23.00	21.34	13.00	21.00	.....
July-December	13.00	18.50	15.79	17.50	21.50	19.06	14.50	22.50	18.53	18.50	25.00	21.61	11.00	14.00	.....
1915.															
January-June	14.50	18.00	16.30	18.00	22.00	19.24	16.00	22.00	18.81	18.00	25.00	22.20	11.00	14.00	11.90
July-December	12.00	21.00	16.36	13.00	23.00	19.02	12.00	24.00	16.16	24.00	31.50	26.07	13.00	18.00	15.64
1916.															
January-June	14.50	20.00	17.27	18.00	24.00	20.76	14.00	21.00	17.95	24.00	31.00	27.19	14.50	19.00	17.03
July-December	9.50	18.00	14.98	14.25	18.50	16.31	11.00	19.50	15.40	18.00	28.00	22.37	14.50	20.00	17.30
1917.															
January-June	15.00	22.00	17.34	15.00	21.50	17.57	14.50	25.00	18.85	18.00	24.00	21.80	19.00	35.00	26.55
July-December	16.50	28.50	23.06	16.50	30.00	23.40	15.00	32.00	25.15	20.00	34.00	25.61	19.00	34.00	25.20
1918.															
January-June	16.00	33.00	25.47	19.00	34.25	27.71	19.00	34.50	27.98	20.00	40.00	32.93	27.00	31.00	28.56
July-December	17.00	35.00	29.32	21.50	34.50	29.14	23.00	35.00	30.15	27.00	48.00	34.10	24.00	30.00	27.35
1919.															
January-June	24.00	37.00	31.49	28.00	42.25	35.02	22.00	39.00	31.93	28.00	48.00	37.92	19.00	26.00	22.98
July-December	26.00	44.00	30.94	26.00	39.25	31.65	22.00	34.00	27.72	32.00	48.00	36.77	17.50	27.00	20.13
1920.															
January	28.00	33.00	31.36	32.75	35.00	33.56	31.00	33.00	32.61	35.00	39.00	36.86	25.00	31.00	27.90
February	32.50	34.00	33.33	36.00	36.50	36.22	31.00	37.00	34.07	52.00	56.00	54.00	29.00	36.00	31.50
March	31.00	37.00	33.90	35.50	39.25	37.35	33.00	40.00	35.76	43.00	55.00	49.65	38.00	41.00	39.50
April	36.00	46.00	40.02	39.75	42.50	41.28	39.00	55.00	46.42	40.00	52.00	46.33	38.00	41.00	39.50
May	35.00	50.00	42.18	42.25	44.75	43.72	45.00	50.00	47.04	42.00	65.00	56.30	38.00	41.00	40.00
June	25.00	46.00	38.42	36.00	44.50	40.82	38.00	46.00	44.33	38.00	54.00	47.60	26.00	41.00	38.50
January-June	25.00	50.00	36.54	32.75	44.75	38.82	31.00	55.00	40.04	35.00	65.00	48.46	25.00	41.00	36.15
July	35.00	42.00	38.30	35.00	38.00	36.97	36.00	45.00	41.06	38.00	50.00	44.60	26.00	28.00	27.00
August	35.00	46.00	40.58	29.50	36.00	33.88	32.00	42.00	37.29	38.00	46.00	42.35	26.00	28.00	27.00
September	29.00	39.00	32.54	29.00	34.50	32.35	26.00	40.00	34.51	41.00	50.00	46.60	26.00	28.00	27.00
October	28.00	36.00	31.10	29.00	31.50	30.34	26.00	35.00	32.82	38.00	41.00	39.30	26.00	29.00	27.29
November	28.00	35.00	31.48	28.00	32.00	30.12	29.00	34.00	31.65	37.00	44.00	40.67	28.00	29.00	28.50
December	26.00	32.00	28.88	25.50	30.25	27.78	28.00	34.00	30.47	34.00	41.00	38.34	21.00	29.00	26.14
July-December	26.00	46.00	33.81	25.50	38.00	31.91	26.00	45.00	34.63	34.00	50.00	41.98	21.00	29.00	27.15

[1] No. 2 timothy for 1919. [2] Fancy wheat, 1913. Fancy large, July-December, 1920.

HAY—Continued.

TABLE 129.—*Wild, salt, and prairie hay: Acreage, production, and total farm value, by States, 1920.*

[000 omitted.]

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Tons.*	*Dollars.*		*Acres.*	*Tons.*	*Dollars.*
Maine	24	24	480	North Dakota	2,052	2,052	23,598
New Hampshire	20	20	400	South Dakota	3,500	3,920	37,632
Vermont	13	13	260	Nebraska	2,315	2,361	25,027
Massachusetts	21	23	460	Kansas	1,016	986	9,860
Rhode Island	1	1	25	Kentucky	10	11	165
Connecticut	13	13	260	Tennessee	40	48	874
New York	55	65	1,170	Alabama	35	35	665
New Jersey	40	54	810	Mississippi	50	70	1,309
Pennsylvania	15	19	342	Louisiana	40	52	988
Delaware	5	8	120	Texas	203	223	3,345
Maryland	6	9	153	Oklahoma	617	740	8,880
Virginia	25	31	496	Arkansas	192	221	3,492
West Virginia	8	10	160	Montana	500	475	4,275
North Carolina	21	23	428	Wyoming	360	360	5,148
South Carolina	10	12	216	Colorado	367	426	5,964
Georgia	12	12	216	New Mexico	30	18	216
Florida	20	20	500	Arizona	14	11	121
Ohio	2	3	45	Utah	116	151	1,510
Indiana	25	30	390	Nevada	145	145	1,450
Illinois	72	86	2,399				
				Idaho	125	150	1,620
Michigan	50	64	800	Washington	34	39	390
Wisconsin	357	457	5,256	Oregon	202	242	1,815
Minnesota	1,663	2,328	28,751	California	180	180	2,160
Iowa	510	648	8,813				
Missouri	135	151	1,812	United States	15,266	17,040	195,266

TABLE 130.—*Wild, salt, and prairie hay: Acreage, production, and value, United States, 1909–1920.*

Year.	Acreage.	Yield per acre.	Production.	Farm price per ton.	Farm value.
	Acres.	*Tons.*	*Tons.*	*Dollars.*	*Dollars.*
1909[1]	17,186,000	1.07	18,383,000		
1910	17,187,000	.77	13,151,000		
1911	17,187,000	.71	12,155,000		
1912	17,427,000	1.04	18,043,000		
1913	16,341,000	.92	15,063,000		
1914	16,752,000	1.11	18,615,000		
1915	16,796,000	1.27	21,343,000		
1916	16,635,000	1.19	19,800,000		
1917	16,212,000	.93	15,131,000	13.49	204,086,000
1918	15,365,000	.94	14,479,000	15.23	220,487,000
1919	15,708,000	1.10	17,269,000	16.68	288,087,000
1920	15,266,000	1.12	17,040,000	11.46	195,266,000

[1] Census figures.

CLOVER AND TIMOTHY SEED.

TABLE 131.—*Clover seed: Acreage, production, and value, by States, 1920, and totals, 1916–1919.*

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Dollars.*	*Dollars.*
New York	15,000	2.4	36,000	13.00	468,000
Pennsylvania	9,000	1.6	14,000	12.90	181,000
Ohio	150,000	1.3	195,000	12.30	2,398,000
Indiana	95,000	1.5	142,000	10.90	1,548,000
Illinois	196,000	1.7	333,000	10.95	3,646,000
Michigan	80,000	1.5	120,000	10.60	1,272,000
Wisconsin	169,000	2.0	338,000	11.50	3,887,000
Minnesota	20,000	2.2	44,000	12.90	568,000
Iowa	134,000	2.0	268,000	12.25	3,283,000
Missouri	35,000	2.2	77,000	10.80	832,000
Nebraska	5,000	2.3	12,000	16.00	192,000
Kansas	7,000	2.2	15,000	9.80	147,000
Kentucky	25,000	2.1	52,000	15.00	780,000
Tennessee	5,000	1.6	8,000	15.00	120,000
Idaho	16,000	5.5	88,000	11.25	990,000
Oregon	5,000	3.6	18,000	12.00	216,000
Total	966,000	1.8	1,760,000	11.66	20,528,000
1919	843,000	1.6	1,341,000	26.50	35,541,000
1918	820,000	1.5	1,197,000	19.80	23,705,000
1917	821,000	1.8	1,488,000	12.84	19,107,000
1916	939,000	1.8	1,706,000	9.18	15,661,000

TABLE 132.—*Clover seed: Farm price per bushel, 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$28.06	$21.55	$14.48	$9.60	$10.27	$8.51	$7.99	$9.41	$10.89	$8.27	$12.90
Feb. 15	31.21	21.79	16.46	9.87	10.47	8.60	8.07	10.28	12.22	8.37	13.73
Mar. 15	31.88	22.61	17.49	10.32	10.76	8.55	8.17	10.42	12.89	8.56	14.16
Apr. 15	32.23	24.81	17.86	10.41	10.58	8.36	8.06	11.00	12.91	8.79	14.50
May 15	29.84	24.48	16.56	10.40	9.98	8.14	7.87	10.74	12.53	8.74	13.93
June 15	26.21	23.37	15.88	10.29	9.47	7.90	7.96	9.77	11.69	8.80	13.13
July 15	25.52	23.25	14.71	10.50	9.15	7.96	8.12	9.78	10.64	8.83	12.85
Aug. 15	19.97	24.33	15.20	10.53	9.12	7.94	8.76	9.37	9.80	9.65	12.47
Sept. 15	17.77	25.38	16.61	10.89	8.65	8.49	9.10	7.31	9.39	10.19	12.38
Oct. 15	13.18	26.47	19.01	11.92	8.54	9.70	8.24	7.00	9.37	10.33	12.38
Nov. 15	11.64	26.53	20.03	12.91	9.20	9.67	8.02	7.33	9.06	10.37	12.48
Dec. 15	10.28	27.63	20.67	13.53	9.40	10.01	8.12	7.70	9.00	10.62	12.70

TABLE 133.—*Timothy seed: Farm price per bushel, 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$5.35	$4.34	$3.57	$2.44	$3.05	$2.63	$2.07	$1.79	$6.99	$4.12	$3.64
Feb. 15	5.62	4.51	3.78	2.46	3.19	2.66	2.12	1.78	7.26	4.51	3.79
Mar. 15	5.61	4.54	3.84	2.70	3.28	2.78	2.30	1.72	7.33	4.93	3.90
Apr. 15	5.63	4.69	3.74	2.76	3.51	2.69	2.28	1.74	7.27	5.17	3.95
May 15	5.61	5.05	3.84	3.09	3.33	2.75	2.38	1.76	7.16	5.24	4.02
June 15	5.46	4.63	3.56	3.09	3.26	2.65	2.23	1.77	6.68	5.24	3.86
July 15	5.44	4.49	3.67	3.04	3.08	2.57	2.32	1.94	5.96	5.48	3.80
Aug. 15	4.44	4.58	3.87	3.23	2.36	2.56	2.43	2.01	3.20	6.52	3.52
Sept. 15	3.52	4.55	3.79	3.31	2.22	2.62	2.46	2.13	2.09	6.65	3.33
Oct. 15	3.25	4.78	4.08	3.61	2.27	2.72	2.34	2.02	1.95	6.91	3.39
Nov. 15	3.09	4.67	4.26	3.25	2.25	2.91	2.34	2.08	1.82	6.90	3.36
Dec. 15	3.16	4.98	4.21	3.37	2.31	2.86	2.18	2.10	1.79	6.72	3.37

CLOVER AND TIMOTHY SEED—Continued.

TABLE 134.—*Clover and timothy seed: Wholesale price, 1914–1920.*

[Compiled from commercial papers.]

Date.	Clover (bushels of 60 pounds).												Timothy.											
	Cincinnati.			Chicago.			Toledo.			Detroit.			Cincinnati.			Chicago.			Milwaukee.			St. Louis.		
	Prime.			Poor to prime.[1]			Poor to choice.			All grades.			Per bushel (of 45 pounds).			Poor to choice (per 100 pounds).			Per 100 pounds.			Poor to prime (per 100 pounds).		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1914.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
January–June	5.00	9.00	6.95	7.00	15.00	11.03	7.25	9.47	8.26	7.40	9.40	......	1.40	2.25	1.80	2.50	5.75	4.34	3.00	5.50	4.02	2.25	5.35	4.07
July–December	5.00	9.25	7.30	9.00	18.50	12.68	8.20	11.15	9.32	8.20	11.25	......	1.40	2.70	2.16	3.50	7.25	5.03	3.20	6.50	4.72	3.25	7.00	5.20
1915.																								
January–June	6.50	9.65	8.01	7.00	14.75	10.81	7.25	9.55	8.18	7.85	9.60	8.52	2.00	3.60	2.81	4.00	7.00	5.63	4.50	7.00	5.51	3.00	7.00	......
July–December	6.50	12.20	8.86	7.00	20.50	13.12	7.40	13.10	10.42	7.70	12.55	10.62	1.90	3.75	2.75	4.50	8.00	6.11	4.50	8.00	6.05	3.00	7.50	......
1916.																								
January–June	6.50	11.50	8.69	6.00	22.00	12.54	8.30	13.65	10.64	8.75	13.25	10.70	1.80	3.30	2.54	4.00	8.50	6.30	4.00	8.50	6.28	3.75	7.50	6.10
July–December	6.50	10.00	8.57	6.00	18.00	12.62	8.40	11.15	9.94	8.60	11.00	9.88	1.20	2.80	1.69	3.00	7.50	4.45	3.50	8.00	4.96	3.00	6.80	4.63
1917.																								
January–June	8.00	11.00	9.58	12.00	19.90	15.13	10.00	11.98	11.05	10.60	11.80	10.98	1.30	3.35	2.17	3.00	8.40	5.06	4.00	8.40	6.02	3.50	7.60	5.46
July–December	9.20	16.00	11.77	12.00	28.00	20.62	10.95	16.35	13.74	10.80	16.50	13.86	2.50	3.50	2.88	4.00	8.50	6.45	6.25	8.50	7.35	6.00	8.25	7.12
1918.																								
January–June	11.00	19.75	15.43	18.00	35.00	24.75	13.00	20.80	18.80	16.00	20.65	18.98	2.50	3.70	3.14	5.00	8.25	6.51	5.00	8.25	6.52	6.50	7.88	7.22
July–December	11.00	22.00	17.11	15.00	38.00	29.77	15.50	26.00	21.48	16.00	25.75	21.27	2.90	5.00	4.00	5.00	11.00	8.17	5.00	11.00	8.19	6.50	10.50	9.02
1919.																								
January–June	10.00	26.00	21.01	24.00	45.00	32.75	22.00	33.00	26.72	23.25	29.50	26.67	3.60	4.90	4.34	6.00	12.00	9.32	6.00	12.00	9.29	7.50	11.35	9.89
July–December	19.00	30.00	25.06	25.00	48.00	36.88	27.75	31.70	29.95	27.00	31.00	29.66	4.25	5.25	4.68	8.00	12.50	10.08	8.00	12.25	10.06	10.00	12.50	11.00
1920.																								
January	25.00	33.50	28.56	30.00	58.00	46.98	31.50	36.70	34.46	31.25	35.75	32.56	4.25	6.10	4.77	9.00	14.50	11.70	11.50	14.50	13.07	11.20	13.50	12.38
February	28.00	34.00	31.00	45.00	55.00	50.38	31.60	36.40	35.32	34.75	35.75	35.07	4.85	6.10	5.48	10.00	16.00	12.88	13.00	16.00	13.74	12.00	14.10	13.15
March	25.00	33.00	27.35	40.00	56.00	47.39	33.25	35.30	33.83	33.25	35.25	34.35	4.50	6.00	5.25	9.00	14.00	11.82	11.00	14.00	12.54	9.50	13.00	11.36
April	23.00	27.00	26.88	25.00	51.00	40.56	25.00	34.25	29.41	27.00	34.50	30.08	4.50	5.50	4.88	8.00	12.50	10.18	10.00	12.50	11.25	9.50	11.50	10.58
May	18.00	27.00	23.75	25.00	35.00	30.00	25.00	27.50	26.17	26.50	28.50	26.98	4.25	5.00	4.72	9.00	12.00	10.50	10.00	12.50	11.20	10.00	10.75	10.38
June	15.00	22.00	19.50	25.00	35.00	30.00	23.00	25.65	25.09	25.00	26.50	25.66	4.25	5.00	4.62	9.00	12.00	10.50	10.00	12.00	11.00	10.60	10.60	10.60
January–June	15.00	34.00	26.17	25.00	58.00	40.88	23.00	36.70	30.71	25.00	35.75	30.78	4.25	6.10	4.95	8.00	16.00	11.26	10.00	16.00	12.13	9.50	14.10	11.41
July	15.00	20.00	17.50	25.00	35.00	30.52	19.20	25.65	24.00	20.50	25.00	24.10	4.25	5.00	4.62	9.00	12.00	10.65	10.00	12.00	11.12	......	......	......
August	15.00	20.00	17.50	20.00	32.00	26.94	17.70	21.55	18.95	17.75	21.75	19.23	3.75	4.25	4.00	6.50	10.75	8.02	7.00	12.00	9.02	7.00	8.50	8.07
September	12.00	20.00	15.80	18.00	30.00	23.54	14.00	18.00	15.68	14.25	18.00	15.55	2.50	4.75	3.22	4.00	7.50	6.32	5.60	7.50	6.60	3.00	7.50	6.44
October	17.00	20.00	16.00	15.00	25.00	18.75	12.30	15.00	13.61	12.50	14.75	13.63	4.00	4.75	4.38	5.00	7.50	5.81	5.00	7.00	5.93	5.00	6.35	5.70
November	10.00	13.00	11.50	15.00	22.00	18.71	11.00	13.95	12.33	11.25	13.75	12.30	2.50	3.00	2.75	5.50	6.75	6.03	5.50	7.00	6.16	5.75	6.60	6.19
December	9.00	13.00	10.80	15.00	20.00	17.50	11.75	13.25	12.21	12.00	12.80	12.36	2.50	3.00	2.75	5.50	6.75	6.12	5.50	6.75	6.12	5.25	6.50	6.06
July–December	9.00	20.00	14.85	15.00	35.00	22.66	11.00	25.65	16.14	11.25	25.00	16.20	2.50	5.00	3.62	4.00	12.00	7.16	5.00	12.00	7.49	3.00	8.50	6.51

[1] Per 100 pounds.

COTTON.

TABLE 135.—*Cotton: Area and production in undermentioned countries, 1909–1919.*

[Bales of 478 pounds net.]

Country.	Area.				Production.			
	Average[1] 1909–1913	1917	1918	1919	Average[1] 1909–1913	1917	1918	1919
NORTH AMERICA.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Bales.*	*Bales.*	*Bales.*	*Bales.*
United States[2]	35,805,667	33,841,000	36,008,000	33,566,000	13,033,137	11,302,000	12,040,532	11,421,000
Porto Rico					[3] 396	268	443	
St. Croix		29			510	16		
West Indies:								
British:								
Barbados[4]	4,227	981			1,211	124		
Grenada[4]		3,190	3,190		688	575	462	
Jamaica[4]		45			66			
Leeward Islands					2,254			
St. Lucia[4]					15			
St. Vincent	[4] 5,045	3,457			[4] 903	431	768	
Dominican Rep.					1,140			
Mexico	245,474	[5,6] 74,130	[5,6] 425,939		201,541	[6] 63,647	[6] 365,709	
SOUTH AMERICA.								
Argentina	5,356	7,598	29,096	32,679	2,646			
Brazil					290,400	449,000		644,000
Peru		141,190	158,218		[4] 87,120		129,140	
EUROPE.								
Bulgaria	[7] 1,829	5,377	7,334		[7] 871			
Malta	1,095	818	744	818	433	332	268	332
ASIA.								
British India	22,079,666	25,188,000	21,037,000	22,186,000	3,511,684	3,347,000	3,328,837	4,743,000
Ceylon	558	161	153		634			
Cyprus					6,611			
Dutch East Indies					15,121			
Indo-China			43,242		[4] 11,689		25,136	
Japanese Empire:								
Japan	6,599	5,866	6,563	5,683	4,704	4,186		
Korea	131,104		219,993		38,037	52,189	[6] 20,921	
Russia:								
Transcaucasia[6]	252,637	[7] 142,300	70,000		79,885			
Central Asia[6]	1,123,433	1,147,000			658,089			
Siam		7,843			5,386			
AFRICA.								
British Africa:								
Lagos						6,527	2,510	
Nyasaland	23,534	29,850	28,041	18,597	4,001	5,439	4,184	1,574
East Africa					435	167	167	84
Gold Coast					34	83	83	
Nigeria N					8,570	3,264	2,510	
Nigeria S						84		
Uganda		124,996	132,994	137,995	17,613	[8] 20,084	[8] 19,247	28,870
Union of South Africa					94	732	1,666	2,96[illegible]
Egypt	1,783,911	1,741,000	1,366,000	1,633,000	1,451,621	1,048,000	1,304,000	999,000
French Africa:								
Dahomey[4]					629			13,201
Guinea					230			
Ivory Coast[4]					84			
German Africa:[5]								
East Africa					[3] 5,807			
Togo[4]					[3] 2,350			
Italian Africa:								
Eritrea[4]					942			
Sudan (Anglo-Egyptian)					13,342	19,247	10,042	[6] 10,293
OCEANIA.								
British:								
Fiji	16				4			
Queensland	523				91			
Solomon Islands					22			
French:								
New Caledonia[4]					463			

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Linters not included, quantity of linters produced, 1,125,719 bales in 1917, 929,516 bales in 1918.
[3] Shipments to United States plus exports to foreign countries.
[4] Exports. [5] Incomplete. [6] Unofficial. [7] Old boundaries. [8] Includes Rhodesia.

COTTON—Continued.

TABLE 136.—*Cotton: World production so far as reported, 1900–1915.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Bales.[1]		*Bales.*[1]		*Bales.*[1]		*Bales.*[1]
1900	15,893,591	1904	21,005,175	1908	23,688,292	1912	19,578,095
1901	15,926,048	1905	18,342,075	1909	20,679,334	1913	21,271,902
1902	17,331,503	1906	22,183,148	1910	22,433,269	1914	23,804,422
1903	17,278,881	1907	18,328,613	1911	21,754,810	1915	17,659,126

[1] Bales of 478 pounds, net weight.

TABLE 137.—*Cotton: Acreage, production, value, exports, etc., in the United States, 1866–1920.*

Year.	Acreage (000 omitted).	Average yield per acre.	Production (000 omitted).	Average farm price per pound Dec. 1.	Farm value Dec. 1 (000 omitted).	New York closing prices, per pound, on middling upland. December. Low.	December. High.	May of following year. Low.	May of following year. High.	Domestic exports, fiscal year beginning July 1.	Imports fiscal year beginning July 1.
	Acres.	*Pounds.*	*Bales.*	*Cents.*	*Dollars.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Bales.*[1]	*Bales.*[1]
1866	7,599	129.0	1,750			$33\frac{5}{8}$	$34\frac{3}{4}$	$27\frac{1}{2}$	$28\frac{1}{2}$	1,322,947	1,852
1867	7,828	189.8	2,340			$15\frac{5}{8}$	$17\frac{1}{4}$	$30\frac{1}{2}$	$32\frac{3}{4}$	1,569,527	1,830
1868	6,799	192.2	2,380			$24\frac{5}{8}$	$25\frac{3}{8}$	$28\frac{5}{8}$	$28\frac{3}{4}$	1,288,656	
1869	7,743	196.9	3,012			25	$25\frac{1}{2}$	$22\frac{1}{2}$	$23\frac{1}{2}$	1,917,117	3,396
1870	8,885	198.9	3,800			15	$15\frac{7}{8}$	$14\frac{7}{8}$	$17\frac{5}{8}$	2,925,856	2,394
1871	7,558	148.2	2,553			$19\frac{1}{8}$	$20\frac{1}{4}$	$23\frac{3}{4}$	$26\frac{3}{8}$	1,867,075	5,788
1872	8,483	188.7	3,920			$19\frac{1}{8}$	$20\frac{1}{4}$	$19\frac{1}{4}$	$19\frac{5}{8}$	2,400,127	8,851
1873	9,510	179.7	3,683			$15\frac{5}{8}$	$16\frac{1}{2}$	$17\frac{3}{4}$	$18\frac{7}{8}$	2,717,205	7,252
1874	11,764	147.5	3,941			$14\frac{1}{8}$	$14\frac{7}{8}$	$16\frac{1}{8}$	$16\frac{3}{8}$	2,520,838	4,299
1875	11,934	190.6	5,123			$13\frac{1}{16}$	$13\frac{5}{16}$	$11\frac{13}{16}$	$13\frac{1}{8}$	2,982,811	4,903
1876	11,677	167.8	4,438	9.0	174,724	$12\frac{1}{16}$	$12\frac{1}{2}$	$10\frac{13}{16}$	$11\frac{3}{8}$	2,890,738	5,313
1877	12,133	163.8	4,370			$11\frac{1}{4}$	$11\frac{1}{2}$	$10\frac{5}{8}$	$11\frac{1}{4}$	3,215,067	6,064
1878	12,344	191.2	5,244	8.2	192,515	$8\frac{13}{16}$	$9\frac{1}{2}$	$11\frac{7}{8}$	$13\frac{3}{4}$	3,256,746	5,987
1879	*14,480*	181.0	5,755	10.3	269,305	$12\frac{3}{8}$	$13\frac{7}{16}$	$11\frac{11}{16}$	$11\frac{7}{8}$	3,644,363	7,096
1880	15,951	184.5	6,343	9.8	289,083	$11\frac{7}{8}$	12	$10\frac{7}{16}$	$10\frac{7}{8}$	4,382,009	8,900
1881	16,711	149.8	5,456			$11\frac{7}{8}$	$12\frac{1}{8}$	$12\frac{1}{16}$	$12\frac{3}{8}$	3,480,792	8,680
1882	16,277	185.7	6,957	9.1	275,513	$10\frac{1}{4}$	$10\frac{7}{16}$	$10\frac{1}{2}$	$11\frac{1}{8}$	4,576,378	8,164
1883	16,778	164.8	5,701	9.1	250,977	$10\frac{7}{8}$	$10\frac{9}{16}$	$11\frac{1}{2}$	$11\frac{3}{4}$	3,725,145	14,039
1884	17,440	153.8	5,682	9.2	246,575	$10\frac{7}{16}$	$11\frac{7}{16}$	$10\frac{11}{16}$	11	3,783,319	10,231
1885	18,301	164.4	6,575	8.4	251,775	$9\frac{3}{16}$	$9\frac{7}{16}$	$9\frac{3}{16}$	$9\frac{5}{16}$	4,116,149	10,145
1886	18,455	169.5	6,446	8.1	251,856	$9\frac{3}{16}$	$9\frac{9}{16}$	$10\frac{3}{4}$	$11\frac{7}{16}$	4,338,915	7,849
1887	18,641	182.7	7,020	8.5	290,901	$10\frac{1}{2}$	$10\frac{5}{8}$	$9\frac{15}{16}$	$10\frac{1}{16}$	4,528,883	10,995
1888	19,059	180.4	6,941	8.5	292,139	$9\frac{3}{4}$	$9\frac{7}{8}$	11	$11\frac{3}{16}$	4,770,065	15,946
1889	*20,175*	159.7	7,473	8.5	275,249	$10\frac{1}{4}$	$10\frac{1}{4}$	$11\frac{15}{16}$	$12\frac{3}{4}$	4,943,925	17,212
1890	19,512	187.0	8,674	8.6	313,360	$9\frac{3}{16}$	$9\frac{7}{16}$	$8\frac{7}{8}$	$8\frac{15}{16}$	5,814,718	41,818
1891	19,059	179.4	9,018	7.2	247,633	$7\frac{3}{4}$	$8\frac{1}{16}$	$7\frac{1}{4}$	$7\frac{7}{16}$	5,870,440	57,328
1892	15,911	209.2	6,664	8.3	277,194	$9\frac{3}{8}$	10	$7\frac{5}{8}$	$7\frac{13}{16}$	4,424,230	86,736
1893	19,525	149.9	7,493	7.0	204,983	$7\frac{13}{16}$	$8\frac{1}{16}$	$7\frac{1}{8}$	$7\frac{3}{8}$	5,366,565	55,412
1894	23,688	195.3	9,476	4.6	212,335	$5\frac{11}{16}$	$5\frac{13}{16}$	$6\frac{3}{4}$	$7\frac{3}{8}$	7,034,866	98,664
1895	20,185	155.6	7,161	7.6	238,503	$8\frac{1}{4}$	$8\frac{9}{16}$	8	$8\frac{3}{8}$	4,670,453	110,701
1896	23,273	184.9	8,533	6.7	286,169	$7\frac{1}{16}$	$7\frac{11}{16}$	$7\frac{5}{8}$	$7\frac{13}{16}$	6,207,510	103,798
1897	24,320	182.7	10,898	6.7	296,816	$5\frac{13}{16}$	$5\frac{15}{16}$	$6\frac{5}{16}$	$6\frac{9}{16}$	7,725,572	105,321
1898	24,967	220.6	11,189	5.7	315,449	$5\frac{5}{8}$	$5\frac{7}{8}$	$6\frac{1}{8}$	$6\frac{1}{4}$	7,575,438	100,316
1899	24,327	183.8	9,345	7.0	326,215	$7\frac{1}{2}$	$7\frac{3}{4}$	9	$9\frac{7}{8}$	6,252,451	134,797
1900	24,933	194.4	10,123	9.2	463,310	$9\frac{3}{4}$	$10\frac{5}{16}$	$8\frac{1}{16}$	$8\frac{5}{16}$	6,718,125	93,263
1901	26,774	170.0	9,510	7.0	334,088	8	$8\frac{3}{4}$	$9\frac{3}{8}$	$9\frac{1}{4}$	7,057,949	197,431
1902	27,175	187.3	10,631	7.6	403,718	$8\frac{1}{2}$	$8\frac{7}{8}$	10.75	12.15	7,138,284	149,749
1903	27,052	174.3	9,851	10.5	516,763	11.95	14.10	12.75	13.90	6,179,712	97,681
1904	31,215	205.9	13,438	9.0	603,438	6.85	9.00	7.85	8.85	8,678,644	121,017
1905	27,110	186.6	10,575	10.8	569,791	11.65	12.60	11.25	12.00	7,268,090	141,927
1906	31,374	202.5	13,274	9.6	635,534	10.45	11.25	11.50	12.90	9,036,434	209,584
1907	29,660	179.1	11,107	10.4	575,226	11.70	12.20	10.20	11.50	7,633,997	142,146
1908	32,444	194.9	13,242	8.7	575,092	9.10	9.35	10.85	11.80	8,895,970	173,036
1909	30,938	154.3	10,005	13.9	697,681	14.65	16.15	14.50	16.05	6,413,416	172,075
1910	32,403	170.7	11,609	14.1	820,407	14.80	15.25	15.35	16.15	8,067,882	227,537
1911	36,045	207.7	15,693	8.8	687,888	9.20	9.65	11.30	11.90	11,070,251	219,560
1912	34,283	190.9	13,703	11.9	817,055	12.75	13.20	11.80	12.10	9,124,591	243,704
1913	37,089	182.0	14,156	12.2	862,708	12.50	13.50	12.90	14.50	9,521,881	246,694
1914	36,832	209.2	16,135	6.8	549.036	7.25	7.80	9.50	10.40	8,807,157	370,409
1915	31,412	170.3	11,192	11.3	631,460	11.95	12.75	12.30	13.35	6,168,140	465,602
1916	34,985	156.6	11,450	19.6	1,122,295	16.20	20.30	19.60	22.10	6,176,162	294,123
1917	33,841	159.7	11,302	27.7	1,566,198	29.85	31.85	25.70	30.10	4,641,023	206,651
1918	36,008	159.6	12,041	27.6	1,663,633	27.50	33.00	25.90	34.00	5,525,894	207,184
1919	33,566	161.5	11,421	35.6	2,034,658	38.00	40.25	40.00	43.00	7,087,487	690,628
1920	36,383	170.8	12,987	14.0	914,590	14.50	16.70				

[1] Bales of 500 pounds, gross weight.

COTTON—Continued.

TABLE 138.—*Cotton: Acreage harvested, by States, 1911-1920.*

[Thousands of acres.]

State.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Virginia	43	47	47	45	34	42	50	44	42	39
North Carolina	1,624	1,545	1,576	1,527	1,282	1,451	1,515	1,600	1,490	1,518
South Carolina	2,800	2,695	2,790	2,861	2,516	2,780	2,837	3,001	2,835	2,877
Georgia	5,504	5,335	5,318	5,433	4,825	5,277	5,195	5,341	5,220	4,958
Florida	308	224	188	221	193	191	183	167	103	101
Alabama	4,017	3,730	3,760	4,007	3,340	3,225	1,977	2,570	2,791	2,842
Mississippi	3,340	2,889	3,067	3,054	2,735	3,110	2,788	3,138	2,848	3,024
Louisiana	1,075	929	1,244	1,299	990	1,250	1,454	1,683	1,527	1,442
Texas	10,943	11,338	12,597	11,931	10,510	11,400	11,092	11,233	10,476	12,576
Arkansas	2,363	1,991	2,502	2,480	2,170	2,600	2,740	2,991	2,725	2,862
Tennessee	837	783	865	915	772	887	882	902	758	824
Missouri	129	103	112	145	96	133	153	148	125	148
Oklahoma	3,050	2,665	3,009	2,847	1,895	2,562	2,783	2,998	2,424	2,765
California	12	9	14	47	39	52	136	[1] 173	[1] 185	[1] 298
Arizona	....	....	....	....	....	....	41	95	107	237
All other	....	....	....	20	15	25	15	12	10	21
United States	36,045	34,283	37,089	36,832	31,412	34,985	33,841	36,008	33,566	36,383

[1] Lower California (149 acres in 1920, 100,000 acres in 1919, and 88,000 acres in 1918) included in California figures but excluded from United States totals.

TABLE 139.—*Cotton: Production of lint (excluding linters) in 500-pound gross weight bales, by States, 1911 to 1920.*

[Thousands of bales, as finally reported by U. S. Bureau of the Census.]

State.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Virginia	30	24	23	25	16	27	19	25	23	19
North Carolina	1,076	866	792	931	699	655	618	898	830	840
South Carolina	1,649	1,182	1,378	1,534	1,134	932	1,237	1,570	1,426	1,530
Georgia	2,769	1,777	2,317	2,718	1,909	1,821	1,884	2,122	1,660	1,400
Florida	83	53	59	81	48	41	38	29	16	18
Alabama	1,716	1,342	1,495	1,751	1,021	533	518	801	713	660
Mississippi	1,204	1,046	1,311	1,246	954	812	905	1,226	961	885
Louisiana	385	376	444	449	341	443	639	588	298	380
Texas	4,256	4,880	3,945	4,592	3,227	3,726	3,125	2,697	3,099	4,200
Arkansas	939	792	1,073	1,016	816	1,134	974	987	884	1,160
Tennessee	450	277	379	384	303	382	240	330	310	310
Missouri	97	56	67	82	48	63	61	62	64	85
Oklahoma	1,022	1,021	840	1,262	640	823	959	577	1,016	1,300
California	10	8	23	50	29	44	58	67	56	[1] 150
Arizona	....	....	....	....	....	....	22	56	60	110
All other	7	3	10	14	7	14	5	6	5	15
United States	15,693	13,703	14,156	16,135	11,192	11,450	11,302	12,041	11,421	12,987

[1] Includes 75,000 bales estimated grown in Lower California, not included in United States totals.

COTTON—Continued.

TABLE 140.—*Cotton: Extent and causes of yearly crop losses, 1909-1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost or freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	2.7	15.3	1.6	0.3	0.2	0.4	0.5	21.2	1.4	18.8	(1)	0.2	41.9
1918	23.8	.9	.3	.6	.1	2.8	.3	29.2	2.0	7.9	(1)	.1	40.3
1917	15.1	1.7	.5	6.0	1.0	.7	.2	25.5	1.3	12.3	(1)	.1	39.9
1916	9.2	9.1	3.1	.4	.7	.6	2.0	25.2	.9	15.7	(1)	.1	42.4
1915	6.8	5.7	1.9	.6	.7	1.1	2.0	19.3	1.9	12.2	(1)	.1	36.8
1914	7.9	2.9	.5	.9	.4	.6	.1	13.8	.2	9.8	(1)	.2	25.4
1913	15.2	2.0	.8	1.1	.4	2.4	.5	23.1	.5	8.9	(1)	.4	33.7
1912	8.1	7.6	1.2	1.0	.6	1.2	.2	20.7	4.3	6.5	0.1	.3	32.7
1911	9.8	2.6	(1)	.3	.1	1.6	.3	15.4	.4	7.9	(1)	.2	26.1
1910	12.2	5.1	.9	2.1	.3	1.6	.1	22.6	.4	7.5	(1)	.3	35.6
1909	14.9	6.0	1.1	1.0	.6	3.0	1.4	28.6	4.2	7.9	(1)	.1	42.0
Average	12.3	4.3	1.0	1.4	.5	1.6	.7	22.3	2.0	9.7	(1)	.2	35.5

[1] Less than 0.05 per cent.

TABLE 141.—*Cotton: Condition of crop, United States, monthly, 1899–1920.*

[Prior to 1901 figures of condition relate to first month following dates indicated.]

Year.	May 25.	June 25.	July 25.	Aug. 25.	Sept. 25.	Year.	May 25.	June 25.	July 25.	Aug. 25.	Sept. 25.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1899	85.7	87.8	84.0	68.5	62.4	1910	82.0	80.7	75.5	72.1	65.9
1900	82.5	75.8	76.0	68.2	67.0	1911	87.8	88.2	89.1	73.2	71.1
1901	81.5	81.1	77.2	71.4	61.4	1912	78.9	80.4	76.5	74.8	69.6
1902	95.1	84.7	81.9	64.0	58.3	1913	79.1	81.8	79.6	68.2	64.1
1903	74.1	77.1	79.7	81.2	65.1	1914	74.3	79.6	76.4	78.0	73.5
1904	83.0	88.0	91.6	84.1	75.8	1915	80.0	80.2	75.4	69.2	60.8
1905	77.2	77.0	74.9	72.1	71.2	1916	77.5	81.1	72.3	61.2	56.3
1906	84.6	83.3	82.9	77.3	71.6	1917	69.5	70.3	70.3	67.8	60.4
1907	70.5	72.0	75.0	72.7	67.7	1918	82.3	85.8	73.6	55.7	54.4
1908	79.7	81.2	83.0	76.1	69.7	1919	75.6	70.0	67.1	61.4	54.4
1909	81.1	74.6	71.9	63.7	58.5	1920	62.4	70.7	74.1	67.5	59.1

COTTON—Continued.

TABLE 142.—*Cotton: Yield per acre, price per pound Dec. 1, and value per acre, by States.*

State.	Yield per acre (pounds of lint).											Farm price per pound (cents).						Value per acre (dollars).[1]	
	10-year average, 1911-1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average, 1911-1920.	1916	1917	1918	1919	1920	5-year average, 1915-1919.	1920
Va.....	256	330	250	240	265	225	310	180	270	255	230	17.6	19.4	27.8	26.5	35.0	15.0	59.33	34.50
N. C...	258	315	267	239	290	260	215	194	268	266	264	17.5	19.4	27.7	26.4	35.2	14.5	57.79	38.28
S. C...	231	280	209	235	255	215	160	208	250	240	254	17.8	19.6	28.4	27.6	35.7	14.5	53.88	36.83
Ga.....	185	240	159	208	239	189	165	173	190	152	135	18.0	19.9	28.8	27.5	35.8	15.3	42.18	20.66
Fla....	114	130	113	150	175	120	105	100	85	74	86	25.5	31.0	50.5	43.0	42.0	17.0	33.69	14.62
Ala....	151	204	172	190	209	146	79	125	149	122	111	17.6	19.5	28.0	27.0	34.8	15.0	29.86	16.65
Miss...	168	172	173	204	195	167	125	155	187	160	140	18.2	20.5	28.5	27.8	37.5	15.3	40.20	21.42
La.....	163	170	193	170	165	165	170	210	167	93	126	17.3	19.1	26.7	27.5	35.0	14.2	37.51	17.89
Tex....	158	186	206	150	184	147	157	135	115	140	160	17.2	19.4	26.7	28.2	35.0	13.2	32.85	21.12
Ark...	185	190	190	205	196	180	209	170	158	155	194	17.6	19.6	28.2	27.8	36.4	13.3	42.02	25.80
Tenn..	191	257	169	210	200	188	206	130	175	195	180	17.2	19.5	27.3	26.7	33.5	13.0	41.79	23.40
Mo....	256	360	260	286	270	240	225	190	200	257	275	17.0	19.0	27.5	27.0	34.0	13.5	52.56	37.12
Okla..	168	160	183	132	212	162	154	165	92	195	225	16.5	19.0	26.5	25.5	35.2	10.5	36.68	23.62
Calif...	364	390	450	500	500	380	400	242	270	268	240	20.2	20.0	28.0	30.0	43.0	30.0	77.31	72.00
Ariz...	264	.....	.....	.....	.....	.....	.....	285	280	270	222	....	....	....	48.0	51.0	30.0	.....	66.60
U. S.	176.8	207.7	190.9	182.0	209.2	170.3	156.6	159.7	159.6	161.5	170.8	17.6	19.6	27.7	27.6	35.6	14.0	41.06	25.14

[1] Based upon farm price Dec. 1.

TABLE 143.—*Cotton: Farm price, cents per pound on 1st of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	35.9	28.7	28.9	17.1	11.4	6.6	11.7	12.2	8.4	14.4	17.5
Feb. 1	36.2	24.9	29.7	16.8	11.5	7.4	11.9	11.9	9.0	14.3	17.4
Mar. 1	36.2	24.0	30.2	15.9	11.1	7.4	12.6	11.8	9.8	13.9	17.3
Apr. 1	37.3	24.5	31.8	18.0	11.5	8.1	11.9	11.8	10.1	13.9	17.9
May 1	37.7	26.0	28.5	18.9	11.5	9.1	12.2	11.6	10.9	14.2	18.1
June 1	37.2	29.5	27.4	20.2	12.2	8.6	12.4	11.5	11.0	14.6	18.5
July 1	37.4	31.1	28.6	24.7	12.5	8.6	12.4	11.6	11.2	14.4	19.2
Aug. 1	36.8	32.5	27.8	24.3	12.6	8.1	12.4	11.5	12.0	13.2	18.3
Sept. 1	31.1	30.3	32.2	23.4	14.6	8.5	8.7	11.8	11.3	11.8	18.4
Oct. 1	25.5	31.3	31.8	23.3	15.5	11.2	7.8	13.3	11.2	10.2	18.1
Nov. 1	19.4	36.5	29.3	27.3	18.0	11.6	6.3	13.0	10.9	8.9	18.1
Dec. 1	14.0	35.6	27.6	27.7	19.6	11.3	6.8	12.2	11.9	8.8	17.6
Average	26.6	31.4	29.4	22.7	15.1	9.7	9.1	12.4	10.5	11.4	17.8

COTTON—Continued.

TABLE 144.—*Cotton: Closing price of middling upland, per pound, 1914–1920.*

[Compiled from commercial papers.]

Date.	New York.			New Orleans.			Memphis.			Galveston.			Savannah.			Charleston.		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1914.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January–June	12.30	14.50	13.16	12$\frac{5}{8}$	13$\frac{15}{16}$	13.17	13.00	13$\frac{3}{4}$	13.32	12$\frac{1}{2}$	14.00	13.12	12$\frac{3}{8}$	13$\frac{7}{8}$	13.13	12$\frac{1}{4}$	13$\frac{1}{2}$	12.92
July–December	7.25	13.25	9.46	6$\frac{1}{2}$	13$\frac{9}{16}$	8.67	6$\frac{1}{2}$	13$\frac{3}{4}$	8.63	6$\frac{5}{8}$	13$\frac{5}{8}$	8.78	6$\frac{1}{2}$	13$\frac{7}{8}$	8.59	6$\frac{1}{2}$	8$\frac{1}{2}$	7.25
1915.																		
January–June	7.90	10.60	9.27	7$\frac{3}{8}$	9.68	8.64	7$\frac{1}{8}$	9.50	8.55	7$\frac{3}{4}$	10.10	8.92	7$\frac{3}{8}$	9$\frac{3}{4}$	8.69	7$\frac{1}{4}$	9$\frac{5}{8}$	8.46
July–December	8.90	12.75	11.01	8.50	12.13	10.69	8.62	12.25	10.60	8.50	12.60	10.74	8$\frac{1}{2}$	12$\frac{1}{2}$	10.54	9.00	12.00	10.85
1916.																		
January–June	11.20	13.45	12.31	11.13	13.06	12.08	11.38	13.25	12.30	11.45	13.75	12.52	11$\frac{1}{2}$	13.00	12.19	11.00	12$\frac{3}{4}$	11.94
July–December	12.90	20.95	16.61	13.00	20.38	16.27	13.12	20.50	16.59	13.65	20.85	16.64	13.00	20$\frac{5}{8}$	16.54	12$\frac{5}{8}$	20$\frac{1}{2}$	16.42
1917.																		
January–June	14.30	27.40	19.72	16.50	26.25	19.36	17.00	26.00	19.55	14.50	26.50	19.48	18$\frac{1}{4}$	26$\frac{3}{4}$	20.22	17$\frac{1}{4}$	26.00	20.04
July–December	21.20	31.85	27.22	20.13	30.13	26.01	22.00	30.00	26.79	21.20	30.35	26.38	20.00	30.00	26.26	20.00	30$\frac{1}{4}$	25.76
1918.																		
January–June	25.70	36.00	31.26	28.50	34.50	31.22	29.00	34.50	31.47	27.25	34.75	31.18	29.00	34.50	31.62	28.50	34.00	31.58
July–December	27.50	38.20	32.28	27.80	34.50	30.60	29.00	35.00	31.08	26.75	36.35	31.55	28.25	35.25	30.62	27.00	35.00	30.30
1919.																		
January–June	25.00	34.95	29.22	25.25	33.00	28.39	26.50	32.75	28.60	25.75	34.20	29.22	26.25	33.50	28.94	25.00	32.90	28.21
July–December	28.85	40.50	35.15	29.00	41.75	35.08	30.00	43.00	35.87	29.50	43.00	36.35	27.75	39.75	34.09	28.00	39.00	33.90
1920.																		
January	38.75	39.75	39.27	39.75	41.00	40.28	40.00	40.50	40.34	42.25	42.75	42.51	39.50	40.25	39.84	38.75	40.00	39.42
February	37.55	40.10	38.79	38.50	40.25	39.40	39.00	40.50	39.17	40.00	42.25	41.06	39.25	39.50	39.43	39.25	40.00	39.30
March	40.25	43.25	41.12	40.25	41.00	40.70	39.00	40.50	40.02	41.50	43.25	42.57	39.50	41.00	40.32	39.00	40.00	39.91
April	41.25	43.25	42.23	41.00	41.75	41.41	41.00	42.00	41.65	42.00	43.50	42.99	41.00	41.75	41.58	40.50	41.00	40.62
May	40.00	43.00	41.24	40.00	41.00	40.28	40.50	42.00	41.42	40.50	42.00	41.63	41.00	42.00	41.57	40.50	40.50	40.50
June	37.75	40.00	39.25	39.50	41.00	40.46	40.00	41.00	40.77	38.50	41.00	39.77	41.50	42.00	41.75	40.50	40.50	40.50
January–June	37.55	43.25	40.32	38.50	41.75	40.42	39.00	42.00	40.56	38.50	43.50	41.76	39.25	42.00	40.75	38.75	41.00	40.04
July	39.25	43.75	41.20	38.75	40.00	39.40	39.50	40.00	39.62	37.50	39.50	38.63	40.75	41.50	41.05	40.50	41.25	40.49
August	31.75	40.00	36.24	29.50	38.50	31.08	33.50	39.50	36.39	30.50	37.00	33.81	30.00	39.00	35.36	35.00	40.50	37.36
September	25.50	32.25	29.88	23.00	29.25	27.31	27.00	33.00	30.95	23.75	30.75	28.01	24.50	31.25	28.49	26.00	35.00	30.20
October	20.50	25.25	22.71	18.75	23.00	20.91	20.00	26.00	21.60	21.00	22.75	22.01	19.75	26.00	22.20	19.50	22.00	20.61
November	15.50	22.50	18.75	15.00	20.75	17.54	15.00	21.00	18.19	15.75	21.25	18.01	15.75	22.00	18.29	16.50	20.00	18.44
December	14.50	16.70	15.68	13.50	15.75	14.62	14.00	15.00	14.78	13.50	15.75	15.06	14.00	16.50	15.72	11.50	16.50	15.78
July–December	14.50	43.75	27.41	13.50	40.00	25.65	14.00	40.00	26.92	13.50	39.50	25.92	14.00	41.50	26.85	14.50	41.25	27.15

COTTON—Continued.

TABLE 145.—*Cotton: International trade, calendar years 1909–1919.*[1]

[Expressed in bales of 500 pounds gross weight or 478 pounds net. The figures for cotton refer to ginned and unginned cotton and linters, but not to mill waste, cotton batting, scarto (Egyptian and Soudan). Wherever unginned cotton has been separately stated in the original reports it has been reduced to ginned cotton in this statement at the ratio of 3 pounds unginned to 1 pound ginned. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 bales.*	*1,000 bales.*	*1,000 bales.*	*1,000 bales.*	*1,000 bales.*	*1,000 bales.*	*1,000 bales.*
Belgium	159	....	....	....	....	....	51
Brazil	83	140	24	5	27	12	56
British India	1,966	2,791	2,103	2,118	1,663	819	1,528
China	240	188	202	237	232	360	299
Egypt	1,442	1,225	1,430	1,122	844	1,040	1,390
France	316	199	38	111	85	29	82
Germany	232	....	....	....	....	....	....
Netherlands	145	111	181	2	....	....	4
Persia[2]	118	105	....	....	....	....	....
Peru	87	106	97	112	80	99	183
United States	9,008	6,873	9,126	7,626	5,180	4,431	7,045
Other countries	169	140	466	96	69	37	....
Total	13,965	11,878	13,667	11,429	8,180	6,827	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	906	....	....	....	....	....	....
Belgium	496	....	....	....	....	....	289
Canada	137	152	197	205	178	226	179
France	1,435	949	1,052	1,178	1,260	656	1,007
Germany	2,258	....	....	....	....	....	....
Italy	896	879	1,344	1,170	828	601	826
Japan	1,405	1,705	2,015	2,299	1,947	1,886	....
Mexico	23	....	....	....	....	....	....
Netherlands	277	245	365	177	46	1	114
Russia	886	901	641	57	....	....	....
Spain	382	389	660	471	447	277	341
Sweden	93	107	558	130	32	33	80
Switzerland	113	101	147	123	94	38	115
United Kingdom	4,164	3,447	4,820	4,045	3,163	3,114	3,846
United States	215	332	424	402	290	236	367
Other countries	319	285	49	334	203	106	....
Total	14,005	9,392	12,272	10,591	8,488	7,174	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.
[2] Year beginning Mar. 21.

COTTONSEED.

TABLE 146.—*Cotton seed: Production, by States, 1911–1920.*

[Thousands of tons, 1911-1919, as reported by the United States Bureau of the Census.]

State.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920[1]
Virginia	13	11	10	11	7	12	8	11	10	8
North Carolina	476	383	351	412	310	290	273	398	368	373
South Carolina	732	526	613	682	504	414	550	699	633	680
Georgia	1,246	798	1,038	1,217	860	826	847	947	736	622
Florida	46	28	31	43	27	26	23	17	8	8
Alabama	762	596	664	778	453	236	230	356	316	293
Mississippi	535	465	583	553	424	361	402	545	427	394
Louisiana	171	167	197	200	151	197	284	261	132	169
Texas	1,893	2,171	1,755	2,043	1,436	1,658	1,390	1,199	1,379	1,871
Arkansas	418	352	477	451	363	504	432	439	393	516
Tennessee	200	123	169	171	135	170	107	147	138	138
Missouri	43	25	30	36	21	28	27	28	28	38
Oklahoma	454	454	373	561	285	366	426	256	452	579
All other	8	5	14	28	16	25	39	57	54	89
United States	6,997	6,104	6,305	7,186	4,992	5,113	5,040	5,360	5,074	5,778

[1] Preliminary.

TABLE 147.—*Cottonseed: Value, by States, 1911–1920.*

[Thousands of dollars.]

State.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920[1]
Virginia	250	240	260	240	260	640	550	740	740	187
North Carolina	9,140	8,460	9,130	8,900	11,470	15,580	18,630	26,810	27,340	10,138
South Carolina	12,590	11,150	15,750	14,190	18,400	22,760	38,200	47,550	47,460	15,630
Georgia	21,060	16,360	25,120	24,580	31,730	45,980	58,660	64,170	55,260	16,807
Florida	800	490	650	740	850	1,240	1,600	1,130	530	226
Alabama	13,870	11,620	15,600	14,700	16,720	12,880	15,910	23,910	23,020	7,333
Mississippi	9,360	10,140	13,060	10,340	14,540	18,840	26,900	35,340	28,100	9,332
Louisiana	3,080	3,290	3,640	3,720	4,830	9,740	18,080	16,650	8,660	4,156
Texas	30,670	37,120	36,150	31,260	42,070	75,940	89,290	74,670	82,640	37,427
Arkansas	6,980	7,040	9,250	7,670	12,380	25,330	28,420	28,240	24,880	11,359
Tennessee	3,620	2,820	4,140	3,130	4,730	8,770	7,090	9,440	9,210	3,435
Missouri	980	550	640	790	660	1,460	1,730	1,760	2,040	833
Oklahoma	7,260	7,950	7,650	8,190	8,720	18,970	26,310	15,920	27,130	10,271
All other	140	100	310	500	540	940	2,180	3,160	3,460	1,321
United States	119,800	117,330	141,350	128,950	167,900	259,070	333,550	349,490	340,470	128,455

[1] Preliminary.

TABLE 148.—*Cottonseed: Farm price per ton on 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$69.88	$64.93	$67.51	$52.53	$36.85	$19.14	$22.70	$21.98	$16.57	$26.35	$39.84
Feb. 15	69.34	64.65	66.95	51.43	36.75	23.33	23.37	22.01	16.81	25.61	40.02
Mar. 15	67.18	64.00	68.27	53.18	36.56	22.32	23.60	21.55	18.21	25.49	40.04
Apr. 15	68.71	64.28	68.08	55.94	38.13	22.69	24.17	21.89	18.62	26.12	40.86
May 15	69.88	63.83	68.16	55.61	37.91	22.07	23.56	21.88	19.21	25.46	40.76
June 15	66.16	63.80	66.03	57.19	35.79	20.82	23.62	21.54	19.24	23.38	39.76
July 15	61.64	64.24	64.11	56.90	36.06	20.05	22.78	21.37	19.04	22.70	38.89
Aug. 15	43.22	66.23	61.34	56.61	35.22	20.14	20.16	20.24	18.02	20.45	36.16
Sept. 15	29.96	62.13	67.90	57.58	41.13	20.98	13.88	21.07	17.61	18.09	35.03
Oct. 15	28.94	66.95	65.85	65.02	47.19	33.73	15.28	22.01	18.04	16.73	37.97
Nov. 15	26.00	72.65	64.97	69.38	55.82	34.01	14.01	22.46	18.57	16.69	39.46
Dec. 15	19.83	69.07	65.05	68.29	56.35	35.54	17.73	23.48	21.42	16.70	39.35

COTTONSEED OIL.

TABLE 149.—*Cottonseed oil: International trade, calendar years, 1909–1919.*[1]

[See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*
Belgium	1,086	....	....	....	....	....	316
China	281	2,261	2,303	1,972	1,388	2,369	....
Egypt	476	491	1,253	418	648	127	59
France	335	124	147	37	15	6	12
Netherlands	52	143	4,265	26	....	....	1,709
United Kingdom	7,189	8,213	7,827	770	649	15	806
United States	38,968	28,841	46,992	25,095	16,627	15,876	25,751
Other countries	44	323	436	510	1,192	1,527	....
Total	48,431	40,396	63,223	28,828	20,519	19,920	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Algeria	364	94	415	84	24	....	....
Australia	142	189	320	151	119	119	....
Austria-Hungary	39	....	....	....	....	....	....
Belgium	2,251	....	....	....	....	....	446
Brazil	624	383	377	181	49	7	11
Canada	2,817	4,079	4,083	4,745	5,246	6,255	5,515
Egypt	257	74	3	....	(2)	....	5
France	3,289	1,318	3,379	1,906	1,903	479	1,384
Germany	6,918	....	....	....	....	....	....
Italy	4,600	702	472	145	71	4	1,095
Malta[3]	265	....	....	....	....	....	....
Martinique	292	285	320	....	276	....	....
Mexico	3,607	....	....	....	....	....	....
Netherlands	5,352	6,438	19,021	8,071	2,508	....	5,837
Norway	1,504	1,912	3,539	3,157	3,658	101	....
Roumania	633	....	....	....	....	....	41
Senegal	422	....	....	....	....	....	....
Serbia	336	....	....	....	....	....	....
Sweden	696	940	1,702	1,541	....	2	....
United Kingdom	5,899	6,193	8,337	2,935	2,564	5,727	7,125
Other countries	4,191	6,420	7,994	6,188	5,020	4,570	....
Total	44,498	29,027	49,962	29,104	21,438	17,264	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.
[2] Less than 500 gallons.
[3] Year beginning Apr. 1.

TOBACCO.

TABLE 150.—*Tobacco: Area and production in undermentioned countries, 1909–1919.*

Country.	Area.				Production.			
	Average[1] 1909–1913.	1917	1918	1919	Average[1] 1909–1913.	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
United States	1,148	1,518	1,647	1,911	996,176	1,249,608	1,439,071	1,454,725
Porto Rico	18	13	24	....	12,700	9,409	17,196	....
Canada:								
Quebec	10	5	7	22	6,262	5,000	8,000	17,000
Ontario	4	3	6	9	8,372	3,495	6,000	11,000
Total Canada	14	8	13	31	14,634	8,495	14,000	28,000
Costa Rica	....	....	....	[2] 2,700	....	....	....	....
Cuba	....	....	....	....	57,490	....	....	....
Dominican Republic	....	....	....	[2] 25	29,200	28,750	[2] 35,000	[2] 30,000
Guatemala	....	....	....	....	674	....	1,049	....
Jamaica	1	1	....	....	418	....	....	....
Mexico	....	....	....	....	34,711	....	27,963	....
SOUTH AMERICA.								
Argentina	24	26	27	....	28,568	14,213	[2] 9,266	....
Brazil	....	....	....	....	59,991	[2] 56,789	....	[2][3] 53,900
Chile	2	4	3	....	3,377	10,958	6,929	....
Uruguay	3	2	2	....	2,371	799	949	....
Paraguay	....	....	35	....	13,000	....	30,864	[2] 35,274
EUROPE.								
Austria[4]	9	....	....	....	14,169	....	....	....
Hungary[4]	120	....	....	....	143,123	....	....	....
Croatia Slavonia[4]	....	....	....	....	107	....	....	....
Bosnia-Herzegovina[4]	....	....	....	....	9,833	....	....	....
Belgium	10	....	15	15	20,741	....	....	23,920
Bulgaria	[4] 24	56	89	[5] 63	[4] 15,220	....	....	....
Denmark	1	1	....	....	219	803	....	....
France[4]	39	14	20	[6] 23	45,272	31,246	19,568	[6] 29,270
Germany[4]	39	....	....	....	66,536	....	....	....
Greece	....	[7] 99	....	....	....	[7] 61,233	63,165	57,195
Italy	19	16	17	21	22,120	11,684	19,841	21,164
Netherlands	1	1	1	1	1,829	....	....	....
Roumania	[4] 25	24	[8] 32	[8] 36	[4] 16,426	....	[8] 13,470	[8] 26,477
Russia proper[4]	108	....	....	....	177,107	....	....	....
Northern Caucasia	64	....	....	....	55,842	....	....	....
Serbia	5	....	....	....	3,988	....	....	....
Sweden	1	1	1	....	1,657	1,486	1,389	....
Switzerland	1	1	1	(9)	1,444	882	....	661
ASIA.								
British India	1,026	1,031	1,015	....	450,000	....	....	....
British North Borneo	....	1	2	....	2,891	....	....	....
Ceylon	14	13	18	....	4,273	....	....	....
Dutch East Indies:								
Java and Madeira	432	[2] 138	....	....	117,180	....	[2] 61,480	....
Sumatra, East coast of	....	....	....	....	46,699	....	[2] 51,801	....
Japanese Empire:								
Japan	72	65	64	77	93,717	91,766	83,544	107,474
Korea (Chosen)	46	36	....	....	29,737	31,085	....	....
Formosa	1	2	....	....	1,120	1,610	....	....
Philippine Islands	155	153	194	....	63,907	107,868	135,705	124,555
Russia, Asiatic	37	....	....	....	30,939	....	....	....
AFRICA.								
Algeria	21	25	27	43	23,974	35,274	33,069	31,658
Tunis	....	(9)	(9)	(9)	259	377	484	617
Nyasaland	7	[10] 9	[10] 9	6	2,416	[10] 4,136	[10] 4,701	2,553
Rhodesia	5	2	3	5	901	[11] 954	[11] 620	1,468
Union of South Africa	19	10	23	....	13,789	7,000	14,931	12,429
OCEANIA.								
Australia	2	1	1	....	1,837	335	400	....
Fiji	....	....	1	....	42	....	....	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Unofficial. [3] State of Bahia. [4] Old boundaries. [5] New boundaries.
[6] Excludes Alsace-Lorraine. [7] Excludes eastern Macedonia. [8] Former Kingdom and Bessarabia.
[9] Less than 500 acres. [10] Cultivated by the Europeans. [11] Southern Rhodesia.

TOBACCO—Continued.

TABLE 151.—*Tobacco: World production so far as reported, 1900–1915.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
	Pounds.		*Pounds.*		*Pounds.*		*Pounds.*
1900	2,201,193,000	1904	2,146,641,000	1908	2,382,601,000	1912	1,274,319,000
1901	2,270,213,000	1905	2,279,728,000	1909	2,742,500,000	1913	2,149,258,000
1902	2,376,054,000	1906	2,270,298,000	1910	2,833,729,000	1914	2,254,087,000
1903	2,401,263,000	1907	2,391,061,000	1911	2,566,202,000	1915	2,153,395,000

TABLE 152.—*Tobacco: Acreage, production, value, condition, etc., in the United States, 1849–1920.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of acres are obtained by applying estimated percentages of increase or decrease to the published acreage of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available.

Year.	Acreage (000 omitted).	Average yield per acre.	Production (000 omitted).	Average farm price per pound Dec. 1.	Farm value Dec. 1 (000 omitted).	Domestic exports of unmanufactured, fiscal year beginning July 1.	Imports of unmanufactured, fiscal year beginning July 1.	Condition of growing crop. July 1.	Aug. 1.	Sept. 1.	When harvested.
	Acres.	*Lbs.*	*Pounds.*	*Cts.*	*Dolls.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1849			*199,753*								
1859			*434,209*								
1869			*262,735*								
1879	*639*	*739.7*	*472,661*								
1889	*695*	*702.5*	*488,257*								
1899	*1,101*	*788.5*	*868,113*	7.2	62,104						
1900	1,046	778.0	814,345	6.6	53,661	315,787,782	26,851,253	88.5	82.9	77.5	76.1
1901	1,039	788.0	818,953	7.1	58,283	301,007,365	29,428,837	86.5	72.1	78.2	81.5
1902	1,031	797.3	821,824	7.0	57,564	368,184,084	34,016,956	85.6	81.2	81.5	84.1
1903	1,038	786.3	815,972	6.8	55,515	311,971,831	31,162,636	85.1	82.9	83.4	82.3
1904	806	819.0	660,461	8.1	53,383	334,302,091	33,288,378	85.3	83.9	83.7	85.6
1905	776	815.6	633,034	8.5	53,519	312,227,202	41,125,970	87.4	84.1	85.1	85.8
1906	796	857.2	682,429	10.0	68,233	340,742,864	40,898,807	86.7	87.2	86.2	84.6
1907	821	850.5	698,126	10.2	71,411	330,812,658	35,005,131	81.3	82.8	82.5	84.8
1908	875	820.2	718,061	10.3	74,130	287,900,946	43,123,196	86.6	85.8	84.3	84.1
1909	1,180	804.3	949,357								
1909	*1,295*	*815.3*	*1,055,765*	10.1	106,599	357,196,074	46,853,389	89.8	83.4	80.2	81.3
1910[1]	1,366	807.7	1,103,415	9.3	102,142	355,327,072	48,203,288	85.3	78.5	77.7	80.2
1911	1,013	893.7	905,109	9.4	85,210	379,845,320	54,740,380	72.6	68.0	71.1	80.5
1912	1,226	785.5	962,855	10.8	104,063	418,796,906	67,977,118	87.7	82.8	81.1	81.8
1913	1,216	784.3	953,734	12.8	122,481	449,749,982	61,174,751	82.8	78.3	74.5	76.6
1914	1,224	845.7	1,034,679	9.8	101,411	348,346,091	45,764,728	66.0	66.5	71.4	81.8
1915	1,370	775.4	1,062,237	9.1	96,281	443,293,156	48,013,335	85.5	79.7	80.7	81.9
1916	1,413	816.0	1,153,278	14.7	169,672	411,598,860	46,136,347	87.6	84.4	85.5	85.6
1917	1,518	823.1	1,249,276	24.0	300,449	289,170,686	79,367,563	86.8	88.1	84.5	87.8
1918	1,647	873.7	1,439,071	28.0	402,264	629,287,761	83,951,103	83.1	83.6	82.4	87.4
1919	1,911	761.3	1,454,725	39.0	566,709	648,037,655	94,005,182	83.6	75.1	71.8	73.6
1920	1,894	796.1	1,508,064	21.1	318,359			84.3	84.1	84.6	83.3

[1] Figures adjusted to census basis.

TABLE 153.—*Tobacco: Acreage, production, and total farm value, by States, 1920.*

State.	Acreage.	Production.	Farm value Dec. 1.	State.	Acreage.	Production.	Farm value Dec. 1.
	Acres.	*Pounds.*	*Dollars.*		*Acres.*	*Pounds.*	*Dollars.*
Massachusetts	10,200	15,810,000	6,419,000	Ohio	63,000	60,480,000	7,862,000
Connecticut	24,400	36,112,000	12,639,000	Indiana	20,000	18,000,000	2,520,000
New York	2,400	3,072,000	829,000	Illinois	700	525,000	163,000
Pennsylvania	40,000	60,400,000	12,080,000	Wisconsin	50,000	62,400,000	16,162,000
Maryland	35,000	30,625,000	8,881,000	Missouri	6,000	6,000,000	1,980,000
Virginia	243,000	177,390,000	42,574,000	Kentucky	550,000	467,500,000	70,125,000
West Virginia	13,000	10,400,000	2,600,000	Tennessee	117,000	85,410,000	17,082,000
N. Carolina	582,000	384,120,000	97,182,000	Alabama	2,500	1,500,000	825,000
S. Carolina	103,000	66,950,000	10,042,000	Louisiana	500	250,000	100,000
Georgia	26,700	16,020,000	5,927,000	Arkansas	800	480,000	149,000
Florida	4,200	4,620,000	2,218,000	U. S.	1,894,400	1,508,064,000	318,359,000

TOBACCO—Continued.

TABLE 154.—*Tobacco: Yield per acre, price per pound Dec. 1, and value per acre, by States.*

State.	Yield per acre (pounds).											Farm price per pound (cents).						Value per acre (dollars).[1]	
	10-year average 1911–1920.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	10-year average 1911–1920.	1916	1917	1918	1919	1920	5-year average 1915–1919.	1920
Massachusetts	1,540	1,650	1,700	1,550	1,750	1,100	1,660	1,400	1,500	1,540	1,550	28.7	25.0	38.4	40.0	46.3	40.6	485.02	629.30
Connecticut	1,556	1,625	1,700	1,550	1,770	1,350	1,630	1,400	1,500	1,560	1,480	29.2	27.0	38.4	44.0	46.3	35.0	517.90	518.00
New York	1,245	1,330	1,300	1,020	1,300	1,200	1,230	1,250	1,250	1,290	1,280	15.9	13.0	22.0	18.0	22.5	27.0	212.83	345.60
Pennsylvania	1,388	1,420	1,450	1,200	1,450	1,350	1,360	1,400	1,420	1,320	1,510	12.9	14.2	21.0	14.0	17.0	20.0	206.74	302.00
Maryland	762	735	660	740	800	740	770	790	830	675	875	16.6	16.0	20.0	30.0	30.0	29.0	159.12	253.75
Virginia	702	800	600	770	650	750	680	700	770	570	730	19.3	14.6	26.5	27.0	47.4	24.0	166.67	175.20
West Virginia	780	750	760	680	820	870	900	800	720	700	800	20.5	15.0	26.0	36.6	50.0	25.0	208.70	200.00
North Carolina	643	710	620	670	650	620	550	630	705	616	660	23.4	20.0	31.5	35.1	53.6	25.3	191.11	166.98
South Carolina	690	810	700	760	730	580	520	710	720	722	650	16.0	14.0	23.1	31.1	22.8	15.0	133.19	97.50
Georgia	872	900	830	1,000	1,000	880	1,180	1,000	800	530	600	32.6	27.0	57.0	46.0	21.5	37.0	314.47	222.00
Florida	1,001	940	840	1,000	1,000	910	1,210	1,100	960	950	1,100	37.8	30.0	57.0	46.0	54.5	48.0	431.73	528.00
Ohio	910	925	920	750	900	900	950	960	980	860	960	15.0	13.0	25.0	19.5	33.7	13.0	185.08	124.80
Indiana	871	910	800	750	900	840	930	950	930	800	900	14.7	13.0	20.0	20.7	35.2	14.0	169.27	126.00
Illinois	765	750	760	700	780	850	750	800	760	750	750	14.6	10.0	19.0	17.0	20.0	31.0	116.54	232.50
Wisconsin	1,192	1,250	1,290	1,180	1,180	900	1,270	1,000	1,330	1,270	1,248	15.0	12.5	17.5	22.0	22.2	25.9	192.46	323.23
Missouri	934	800	1,000	650	1,200	900	950	940	900	1,000	1,000	19.2	15.0	21.2	25.0	36.0	33.0	206.96	330.00
Kentucky	858	880	780	760	910	810	900	900	960	830	850	15.5	12.7	20.0	26.3	38.2	15.0	185.40	127.50
Tennessee	771	810	660	720	820	750	800	810	800	810	730	13.1	10.1	17.0	21.4	25.1	20.0	128.05	146.00
Alabama	631	700	750	700	700	500	300	730	700	630	600	31.5	30.0	35.0	30.0	30.0	55.0	170.90	330.00
Louisiana	417	450	300	450	400	420	450	350	420	434	500	38.4	28.0	35.0	65.0	65.0	40.0	185.92	200.00
Arkansas	618	600	650	650	610	600	500	700	700	570	600	21.6	20.0	23.2	25.0	35.0	31.0	147.78	186.00
United States	815.5	893.7	785.5	784.3	845.7	775.4	816.0	823.1	873.7	761.3	796.1	17.8	14.7	24.0	28.0	39.0	21.1	185.82	168.05

[1] Based upon farm price Dec. 1.

TOBACCO—Continued.

TABLE 155.—*Tobacco: Extent and causes of yearly crop losses, 1909–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost and freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Defective seed.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	8.9	7.9	0.6	0.2	1.1	0.1	0.2	19.2	0.6	2.8	......	(1)	23.0
1918	8.6	.4	.2	.7	1.1	.2	.2	11.4	.3	2.1	......	.1	14.2
1917	3.3	2.2	.5	3.3	1.2	.1	.2	11.1	.2	2.1	......	.1	15.2
1916	3.5	5.5	1.3	1.3	1.0	.1	.8	14.0	.3	2.8	......	(1)	18.4
1915	3.9	8.2	.9	1.2	.8	.1	.9	16.3	.6	4.0	......	.1	23.5
1914	18.1	.2	.1	.4	.6	.3	.1	20.1	(1)	2.7	......	.1	24.8
1913	15.3	.7	.4	1.2	1.2	.3	.6	20.0	.1	3.0	......	(1)	25.0
1912	7.6	4.8	.8	.5	1.0	.2	.2	15.3	.7	2.8	......	.1	21.2
1911	16.7	.9	......	.8	.1	.6	......	19.5	.3	1.0	......	.2	22.6
1910	4.8	6.8	1.2	.4	.3	(1)	.1	14.4	.7	2.8	......	.1	20.6
1909	5.5	6.8	1.1	.7	.8	.1	.2	15.3	.7	2.6	......	(1)	19.6
Average	8.7	3.7	.6	1.1	.8	.2	.3	15.8	.4	2.6	......	.1	20.5

[1] Less than 0.05 per cent.

TOBACCO—Continued.

TABLE 156.—*Tobacco: Wholesale price per pound, 1914–1920.*

[Compiled from commercial papers.]

Date.	Cincinnati.			Hopkinsville.			Louisville.			Clarksville.			Richmond.			Baltimore.		
	Leaf, plug stock,[1] common to good red.			Leaf, common to fine.			Leaf (Burley, dark red), common to good.			Leaf, common to fine.[2]			Leaf, smokers', common to fine.			Leaf (Maryland), medium to fine red.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1914.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January–June	5.50	14.00	....	8.00	14.00	....	9.00	16.00	....	9.50	16.00	....	7.00	20.00	....	8.50	15.00	....
July–December	5.50	13.00	....	7.50	14.00	....	9.00	16.00	....	7.50	16.00	....	7.00	20.00	....	8.00	15.00	....
1915.																		
January–June	6.00	13.00	....	4.00	12.50	....	8.00	14.00	....	6.00	13.00	....	7.00	20.00	....	8.00	13.00	....
July–December	5.00	13.00	....	5.50	10.00	....	10.00	15.00	....	6.00	13.00	....	7.00	20.00	....	8.00	14.00	....
1916.																		
January–June	5.00	16.00	....	5.00	14.00	....	10.00	16.00	....	4.50	13.00	....	7.00	20.00	....	9.00	16.00	....
July–December	7.50	17.00	....	7.50	14.50	....	11.00	19.00	....	4.50	12.00	....	9.00	18.00	....	11.00	21.00	....
1917.																		
January–June	15.00	21.00	....	10.00	19.00	....	13.00	20.00	....	8.00	14.50	....	9.00	27.00	....	17.00	24.00	....
July–December	15.00	28.00	....	10.50	20.50	....	17.00	32.00	....	6.00	15.00	....	12.00	27.00	....	19.00	28.00	....
1918.																		
January–June	22.00	40.00	28.25	14.00	23.50	18.10	25.00	44.00	29.09	....	....	....	[3] 21.00	[3] 30.00	[3] 24.97	22.00	39.00	27.10
July–December	22.00	40.00	31.00	14.50	25.00	19.96	30.00	44.00	39.58	....	....	....	16.00	45.00	32.50	33.00	49.00	40.03
1919.																		
January–June	32.00	50.00	43.00	15.00	36.50	24.57	15.00	48.00	30.32	10.00	35.00	20.39	15.00	45.00	28.62	31.00	40.00	36.00
July–December	15.00	45.00	26.00	12.14	28.25	19.23	10.00	45.00	22.83	....	....	....	15.00	37.00	26.00	26.00	53.00	38.44
1920.																		
January	15	35	....	20.00	53.00	32.95	28.00	40.00	34.80	17.00	40.00	28.60	15.00	37.00	26.00	31.00	53.00	42.00
February	15	70	....	18.00	42.00	30.38	21.00	42.00	33.40	16.00	42.50	29.25	15.00	37.00	26.00	31.00	53.00	42.00
March	15	70	....	17.00	40.00	28.42	21.00	37.00	30.50	16.00	42.50	32.25	15.00	37.00	26.00	31.00	53.00	42.00
April	15	70	....	16.00	42.00	28.82	22.00	35.00	28.50	....	....	....	15.00	37.00	26.00	25.00	53.00	40.62
May	15	70	....	16.00	43.50	28.38	15.00	35.00	25.88	....	....	....	15.00	37.00	26.00	25.00	48.00	36.50
June	15	70	....	16.00	41.50	28.30	15.00	35.00	25.00	....	....	....	15.00	37.00	26.00	25.00	48.00	37.12
January–June	15	70	....	16.00	53.00	29.54	15.00	42.00	29.68	....	....	....	15.00	37.00	26.00	25.00	53.00	40.04
July	15	70	....	15.00	39.50	24.92	15.00	35.00	25.00	20.00	40.00	30.00	15.00	37.00	26.00	30.00	48.00	39.00
August	15	70	....	14.00	30.00	22.00	15.00	35.00	25.00	7.00	24.00	15.50	15.00	37.00	26.00	30.00	55.00	42.00
September	15	70	....	14.00	20.00	19.00	13.00	35.00	24.50	....	....	....	15.00	37.00	26.00	35.00	55.00	45.00
October	....	....	....	....	....	....	13.00	35.00	24.00	....	....	....	15.00	37.00	26.00	35.00	55.00	45.00
November	....	....	....	....	....	....	13.00	35.00	24.00	....	....	....	10.00	37.00	17.75	25.00	58.00	41.50
December	....	....	....	....	....	....	13.00	35.00	24.00	....	....	....	10.00	20.00	15.00	25.00	58.00	41.50
July–December	15	70	....	14.00	39.50	21.97	13.00	35.00	24.42	7.00	40.00	22.75	10.00	37.00	22.79	25.00	58.00	42.33

[1] Burley, dark and bright red, common to good, February to December, 1917, inclusive, and all of 1918 and 1919, dark and fine red lugs, 1920.
[2] No quotations for 1918.
[3] No grade given five month's average.

TOBACCO—Continued.

TABLE 157.—*Tobacco (unmanufactured): International trade, calendar years 1909–1919.*[1]

[Tobacco comprises leaf, stems, strippings, and tombac, but not snuff. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Aden [2]	7,739	7,047	7,421	....	....	....	....
Algeria	11,681	7,374	9,088	6,871	4,233	14,835	25,518
Austria-Hungary	23,192	....	....	....	....	....	....
Brazil	59,991	59,481	59,292	46,344	55,738	63,957	93,862
British India	28,874	23,349	32,877	35,716	28,488	28,514	44,610
Bulgaria	4,310	....	....	....	....	....	....
Ceylon	4,093	4,821	3,118	2,734	3,445	4,754	....
Cuba	38,035	36,868	38,799	39,572	28,829	27,351	....
Dominican Republic	22,395	8,169	13,747	17,472	19,294	33,510	44,758
Dutch East Indies	163,823	148,174	184,388	208,060	28,344	17,746	....
Greece	18,113	20,347	33,232	16,765	28,199	....	....
Mexico	1,845	....	....	....	....	....	....
Netherlands	3,786	3,663	10,948	8,634	65,881	7,270	60,048
Paraguay	11,361	9,993	15,782	....	....	....	....
Persia [3]	3,874	1,493	....	....	....	....	....
Philippine Islands	26,018	29,533	24,663	39,655	15,134	56,705	....
Russia	23,283	9,955	6,499	16,106	....	....	....
United States	381,127	347,295	433,673	483,955	251,863	406,827	776,678
Other countries	94,995	53,500	44,371	56,026	61,531	61,600	....
Total	928,535	771,062	917,898	977,910	590,479	723,069	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Aden [2]	11,619	9,822	8,717	....	....	....	....
Argentina	14,988	17,040	17,644	19,168	27,278	12,454	18,967
Australia	13,740	10,688	12,540	16,878	5,707	15,989	....
Austria-Hungary	49,984						
Belgium	22,094	....	....	....	....	....	30,143
British India	6,538	5,914	5,315	7,321	8,129	5,775	9,404
Canada	17,891	16,934	18,245	20,878	18,570	22,970	24,891
China	15,113	15,781	10,230	19,618	20,524	24,145	....
Denmark	8,774	12,797	12,784	15,632	6,077	3,682	....
Egypt	19,005	17,077	15,472	15,000	14,274	15,027	17,998
Finland	9,597	10,674	13,719	14,947	....	....	....
France	63,914	61,349	51,425	65,924	70,915	110,120	108,153
Germany	168,437	....	....	....	....	....	....
Italy	47,732	41,425	36,693	40,833	55,019	42,150	63,093
Netherlands	57,218	59,708	59,627	61,977	66,800	831	232,655
Nigeria	6,050	4,858	6,045	5,239	4,602	....	....
Norway	3,994	4,645	4,591	5,171	5,021	3,416	....
Portugal	6,565	7,662	4,733	8,299	4,587	....	....
Spain	51,026	35,677	40,789	33,492	41,342	49,807	70,422
Sweden	9,772	9,383	7,595	10,160	10,514	7,484	12,892
Switzerland	17,949	22,300	17,591	21,826	17,551	13,866	27,742
United Kingdom	117,956	154,437	190,606	151,196	44,359	171,428	349,322
United States	52,768	57,407	41,304	49,473	57,960	83,514	85,986
Other countries	51,266	63,142	49,416	37,233	24,628	24,929	....
Total	844,090	638,720	625,081	620,265	503,857	607,587	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.
[2] Year beginning Apr. 1.
[3] Year beginning Mar. 21.

APPLES.

TABLE 158.—*Apples: Production and prices, Dec. 1, by States, 1917–1920.*

State.	Total crop (000 omitted).				Price per bushel Dec. 1.			
	1920	1919	1918	1917	1920	1919	1918	1917
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Maine	1,930	5,558	2,010	4,275	120	117	95	95
New Hampshire	1,320	1,510	1,155	1,035	150	160	110	120
Vermont	1,600	1,500	990	1,248	150	175	140	130
Massachusetts	3,680	3,240	2,430	2,163	120	200	160	155
Rhode Island	340	294	189	195	200	195	155	150
Connecticut	2,520	1,572	909	1,251	125	170	155	144
New York	55,650	16,800	40,878	16,266	75	200	112	132
New Jersey	4,134	2,113	2,463	2,058	120	200	160	125
Pennsylvania	23,937	7,972	16,080	11,646	90	225	120	126
Delaware	1,017	750	714	798	95	200	125	110
Maryland	3,330	1,944	2,034	2,559	78	200	110	97
Virginia	15,210	9,950	10,068	11,778	90	160	124	101
West Virginia	7,000	3,478	5,856	4,320	125	180	117	122
North Carolina	7,900	2,500	3,588	4,500	105	187	130	114
South Carolina	1,482	700	1,407	1,635	184	280	205	155
Georgia	1,764	636	1,713	1,713	165	245	165	120
Ohio	13,193	2,806	7,005	5,760	115	262	153	150
Indiana	6,097	1,700	1,794	4,836	143	267	180	121
Illinois	6,175	4,943	3,459	7,518	140	230	185	110
Michigan	16,500	6,484	9,792	4,146	77	220	115	140
Wisconsin	3,650	2,700	2,811	3,090	170	220	155	134
Minnesota	1,462	1,365	996	1,446	200	250	209	155
Iowa	4,410	1,815	1,584	3,795	191	275	206	145
Missouri	5,082	5,773	4,245	8,070	170	190	164	106
South Dakota	323	302	273	336	260	300	235	170
Nebraska	750	1,125	525	1,854	230	250	230	140
Kansas	1,144	1,835	1,503	2,853	220	210	190	135
Kentucky	5,780	1,480	2,799	5,802	160	250	170	117
Tennessee	5,304	1,560	4,050	4,170	142	225	156	122
Alabama	1,260	617	1,662	1,449	175	250	170	140
Mississippi	126	144	....	....	190	235	....	....
Texas	351	624	273	357	200	190	160	156
Oklahoma	548	1,512	660	1,293	230	175	201	130
Arkansas	3,620	5,100	1,290	2,574	140	170	140	135
Montana	1,155	1,289	792	1,044	180	175	210	100
Colorado	2,760	3,418	2,067	2,190	140	185	170	80
New Mexico	566	1,329	912	879	180	200	118	150
Arizona	100	154	138	129	250	225	240	205
Utah	918	779	786	906	120	170	140	80
Idaho	3,631	4,300	1,200	3,843	145	180	170	95
Washington	13,420	25,348	16,491	19,830	140	155	125	125
Oregon	3,300	5,579	3,384	4,335	125	140	110	105
California	6,003	8,640	6,560	6,804	160	145	130	115
United States	240,442	153,238	169,625	166,749	113.1	186.0	132.8	121.7

APPLES—Continued.

TABLE 159.—*Apples: Total production (bushels) in the United States, 1889–1920.*

Year.	Production.	Year.	Production.	Year.	Production.	Year.	Production.
1889[1]	*143,105,000*	1897	163,728,000	1905	136,220,000	1913	145,410,000
1890	80,142,000	1898	118,061,000	1906	216,720,000	1914	253,200,000
1891	198,907,000	1899[1]	*175,397,000*	1907	119,560,000	1915	230,011,000
1892	120,536,000	1900	205,930,000	1908	148,940,000	1916	193,905,000
1893	114,773,000	1901	135,500,000	1909[1]	*146,122,000*	1917	166,749,000
1894	134,648,000	1902	212,330,000	1910	141,640,000	1918	169,625,000
1895	219,600,000	1903	195,680,000	1911	214,020,000	1919	153,238,000
1896	232,600,000	1904	233,630,000	1912	235,220,000	1920	240,442,000

[1] Census figures.

TABLE 160.—*Apples: Farm price, cents per bushel, on 1st of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	213.8	147.7	128.8	101.1	79.7	68.0	107.1	73.4	89.4	108.0	111.7
Feb. 1	214.7	160.4	140.1	110.0	88.0	71.2	116.8	76.4	95.8	117.2	119.1
Mar. 1	231.8	175.4	145.3	123.3	92.0	73.2	126.0	80.4	101.2	121.6	127.0
Apr. 1	260.1	201.6	151.9	133.0	94.9	76.8	133.0	83.7	109.2	131.8	137.6
May 1	285.5	224.5	154.8	149.8	98.0	85.4	141.8	89.5	121.8	139.2	140.0
June 1	297.0	237.3	158.2	157.2	105.4	90.4	141.0	97.6	118.4	137.5	154.0
July 1	280.7	197.7	150.4	151.1	108.1	84.4	113.4	93.6	95.2	115.1	139.0
Aug. 1	198.4	174.7	128.1	127.0	80.4	70.1	79.9	80.6	75.0	83.9	109.8
Sept. 1	137.4	162.0	123.7	107.8	77.7	59.9	65.1	75.8	64.8	71.6	95.6
Oct. 1	132.8	171.1	133.5	106.8	83.1	62.0	58.8	81.0	61.8	68.0	95.9
Nov. 1	130.0	182.8	138.6	117.5	87.6	69.2	56.6	90.0	62.4	69.4	100.4
Dec. 1	113.1	186.0	132.8	121.7	91.2	69.0	59.4	98.1	66.3	72.1	101.0

TABLE 161.—*Apples: Extent and causes of yearly crop losses, 1912–1919.*

Year.	Deficient moisture.	Excessive moisture.	Floods.	Frost and freeze.	Hail.	Hot winds.	Storms.	Total climatic.	Plant disease.	Insect pests.	Animal pests.	Total.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1919	4.3	2.9	0.1	29.1	0.6	0.6	1.0	39.1	5.1	2.7	0.1	52.7
1918	7.5	.7	.2	19.1	.8	1.0	.7	30.7	4.2	2.9	.2	44.9
1917	4.1	3.9	.1	15.2	1.1	.3	1.1	27.0	4.7	2.8	.1	44.2
1916	5.4	3.2	.2	9.9	.9	.6	1.4	22.8	5.6	3.0	.1	38.6
1915	1.2	1.9	.2	15.8	.9	.1	1.2	21.8	5.2	3.0	.1	35.4
1914	6.5	.3	(1)	6.4	.6	.4	.6	15.1	.8	5.0	.1	28.2
1913	10.3	.4	.4	25.3	.6	.9	.6	39.9	1.0	5.2	(1)	53.5
1912	2.5	.9	.3	10.2	.7	.3	.9	16.9	4.2	3.1	.1	32.4
Average	5.4	1.6	.2	14.6	.8	.5	.9	24.9	3.7	3.6	.1	39.6

[1] Less than 0.05 per cent.

APPLES—Continued.

TABLE 162.—*Estimated annual production of the commercial apple crop in the United States for the years 1916 to 1920, inclusive.*

[By commercial crop is meant that portion of the total crop which is sold for consumption as fresh fruit. One barrel is equivalent to three boxes.]

State.	1920	1919	1918	1917	1916
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
Maine	265,000	601,000	226,000	400,000	536,000
New Hampshire	170,000	187,000	122,000	120,000	198,000
Vermont	190,000	203,000	105,000	132,000	388,000
Massachusetts	375,000	335,000	300,000	225,000	368,000
Rhode Island	75,000	48,000	20,000	19,000	27,000
Connecticut	210,000	119,000	108,000	96,000	146,000
New York	9,275,000	2,975,000	5,950,000	2,058,000	5,544,000
New Jersey	1,075,000	578,000	514,000	408,000	462,000
Pennsylvania	2,000,000	759,000	1,116,000	854,000	1,225,000
Delaware	271,000	192,000	186,000	191,000	108,000
Maryland	511,000	226,000	315,000	263,000	311,000
Virginia	2,636,000	1,508,000	1,766,000	1,687,000	2,179,000
West Virginia	1,167,000	648,000	1,092,000	688,000	1,140,000
North Carolina	305,000	92,000	184,000	200,000	270,000
South Carolina	14,000				
Georgia	118,000	57,000	117,000	120,000	111,000
Ohio	1,363,000	264,000	902,000	503,000	747,000
Indiana	773,000	197,000	266,000	456,000	298,000
Illinois	1,441,000	750,000	837,000	1,554,000	1,040,000
Michigan	3,167,000	1,109,000	1,495,000	515,000	1,414,000
Wisconsin	180,000	126,000	114,000	124,000	105,000
Minnesota	78,000	61,000	40,000	60,000	42,000
Iowa	420,000	174,000	101,000	275,000	180,000
Missouri	1,033,000	1,127,000	735,000	1,128,000	675,000
South Dakota	5,000	3,000	3,000	4,000	5,000
Nebraska	127,000	215,000	72,000	226,000	142,000
Kansas	286,000	459,000	333,000	650,000	560,000
Kentucky	250,000	65,000	108,000	153,000	135,000
Tennessee	312,000	87,000	218,000	192,000	147,000
Alabama	21,000	10,000	26,000	24,000	19,000
Texas	20,000	40,000	11,000	23,000	20,000
Oklahoma	29,000	43,000	17,000	54,000	27,000
Arkansas	724,000	1,020,000	241,000	409,000	245,000
Montana	115,000	124,000	75,000	74,000	70,000
Colorado	736,000	828,000	527,000	701,000	677,000
New Mexico	125,000	224,000	117,000	175,000	108,000
Arizona	10,000	16,000	15,000	16,000	17,000
Utah	196,000	121,000	163,000	184,000	24,000
Idaho	781,000	1,058,000	112,000	873,000	170,000
Washington	3,623,000	6,817,000	4,296,000	4,620,000	4,892,000
Oregon	800,000	1,357,000	671,000	713,000	801,000
California	1,000,000	1,400,000	1,127,000	1,174,000	1,174,000
United States	36,272,000	26,223,000	24,743,000	22,341,000	26,747,000

APPLES—Continued.

TABLE 163.—*Approximate relative production of principal varieties of apples, expressed as percentages of a normal crop of all apples.*

Variety.	United States.	Maine.	New York.	Pennsylvania.	Virginia.	West Virginia.	Ohio.	Michigan.	Illinois.	Missouri.	Kentucky.	Arkansas.	Washington.	Oregon.	California.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct*
Arkansas (Mammoth Black Twig)	0.7	0.2	.....	0.3	3.1	0.7	0.6	0.0	0.9	1.1	0.9	2.3	0.3	.....	0.3
Arkansas Black	.9	.....	.....	.2	.7	.8	.1	.....	.7	1.5	3.0	3.0	2.3	1.1	1.0
Baldwin	13.4	34.5	31.3	17.8	2.8	5.8	15.1	17.0	2.8	1.5	2.9	.4	7.8	12.6	3.2
Ben Davis	13.3	9.8	5.0	6.0	11.4	15.7	13.9	8.5	37.0	34.2	16.8	44.1	7.4	4.9	3.9
Early Harvest (Prince's Harvest)	2.8	.9	.9	3.1	4.7	3.9	3.7	1.8	2.2	2.8	6.4	2.0	.8	.7	.7
Fall Pippin	1.7	.7	1.7	3.1	1.8	1.5	1.8	1.6	1.1	.4	2.4	.7	.8	.8	.6
Fameuse (Snow)	1.3	3.5	2.4	.6	.1	.0	.6	3.0	1.5	.4	.0	.1	.3	.2	.0
Gano	1.6	.3	.2	.8	.6	1.6	1.3	.3	3.8	6.5	.2	6.6	.8	1.0	.2
Golden Russet	1.4	1.7	2.0	2.5	.3	1.6	.9	3.7	.7	.3	1.0	.1	.3	.6	.1
Gravenstein	1.1	2.3	.9	1.0	.1	.1	.3	.1	.1	.1	.0	.....	4.1	7.3	8.9
Grimes (Grimes Golden)	2.2	.2	.1	2.6	2.6	4.6	5.0	1.2	4.9	3.6	2.6	2.1	1.6	.4	.1
Horse (Yellow Horse)	.9	.....	.....	.....	1.0	.0	.0	.0	.2	.5	2.1	1.5	.....	.1	.....
Jonathan	3.6	.8	.4	1.4	1.0	1.7	1.8	2.2	9.3	10.4	2.5	3.7	13.8	4.4	1.7
Limbertwig (Red Limbertwig)	1.6	.0	.0	.....	2.5	.8	.3	.0	.6	1.5	4.0	5.8	.....	.2	.3
McIntosh (McIntosh Red)	.9	3.7	1.6	.7	.1	.1	.1	.3	.4	.1	.1	.1	.3	.1	.1
Maiden Blush	2.0	.3	1.0	3.0	1.5	2.5	4.5	2.6	2.3	2.8	4.5	1.0	.3	.2	.4
Missouri (Missouri Pippin)	.8	.0	.0	.0	.2	.1	.1	.1	1.2	3.0	.5	1.4	.5	.1	.9
Northern Spy	6.1	7.1	13.1	11.4	.8	4.2	7.7	17.9	1.4	1.1	1.4	.5	3.8	7.4	.6
Northwestern Greening	.9	.3	.9	.4	.0	.4	.6	1.9	.3	.3	.4	.....	1.0	.1	.2
Oldenburg (Duchess of Oldenburg)	1.9	2.9	2.2	1.1	.1	.5	1.0	5.0	1.7	.5	.1	.....	1.1	.3	.1
Red Astrachan	1.9	3.9	2.1	3.5	.8	2.1	2.7	2.8	.8	.8	.3	.5	1.7	2.2	3.3
Red June (Carolina Red June)	1.6	.....	.7	.3	1.8	1.3	.2	.0	1.2	1.9	4.3	2.7	1.3	1.3	1.4
Rhode Island Greening	4.7	4.1	14.8	5.5	.3	1.4	5.7	5.4	.8	.3	.2	.6	2.2	2.6	2.7
Rome Beauty	3.1	.1	.3	2.1	1.2	18.7	10.8	.2	3.8	1.7	9.6	1.8	12.2	5.6	2.4
Stayman Winesap	1.5	.6	.1	1.8	5.3	1.9	1.3	.1	.5	1.8	1.9	1.7	2.7	1.8	.9
Tolman (Tolman Sweet)	1.0	2.6	2.1	1.1	.1	.4	.5	2.4	.3	.2	.3	.....	.9	.....	.0
Tompkins King (King of Tompkins Co.)	1.4	2.4	4.1	1.5	.0	.5	.6	2.1	.1	.1	.0	.....	2.7	5.1	1.1
Wealthy	2.2	5.4	1.8	1.2	.0	1.1	1.2	3.7	1.6	1.3	.4	.1	1.5	1.1	.1
White Pearmain (White Winter Pearmain)	.5	.....	.1	.0	.2	.2	.1	.0	.2	.3	.3	.1	.6	.5	7.5
Winesap	5.1	.5	.1	1.8	20.7	1.8	1.8	.4	5.6	6.8	14.0	8.4	7.1	2.9	1.4
Wolf River	.9	1.4	.3	.3	.2	.6	.5	1.5	.4	.7	.3	.....	.8	1.7	.1
Yellow Bellflower	1.4	1.7	.3	2.3	.2	1.5	1.3	1.2	.5	1.0	.6	.1	1.9	3.4	18.6
Yellow Newtown (Albemarle; Newtown Pippin)	1.6	.0	.2	.6	7.0	.3	.4	.3	.2	.1	.2	.....	2.9	11.3	28.7
Yellow Transparent	1.5	1.1	.3	1.7	1.5	3.2	2.1	1.4	2.1	1.1	3.2	.4	1.5	1.6	.2
York Imperial (Johnson Fine Winter)	2.1	.....	.1	7.5	15.1	5.0	1.3	.3	.8	1.1	.1	.1	.2	.9	.1
Other varieties	10.4	7.0	8.9	12.8	10.2	13.4	10.1	11.0	7.4	8.2	12.5	8.2	12.3	15.5	8.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE.—In important apple-producing States not included in table, the principal varieties and their respective percentages of all apples in a normal crop are:

Indiana.—Ben Davis 22.8, Baldwin 7.2, Grimes Golden 6.7, Winesap 6.7, Maiden Blush 5.8, Rome Beauty 4.4, Northern Spy 4.2. *North Carolina.*—Limbertwig 14.3, Winesap 12.2, Ben Davis 7.5, Early Harvest 7.2, Horse 7.2, Red June 5.9. *Tennessee.*—Winesap 14.1, Ben Davis 12.2, Limbertwig 12.1, Early Harvest 8.4, Horse 6.3, Red June 5.4. *Iowa.*—Ben Davis 15.2, Wealthy 12.4, Jonathan 10.3, Oldenburg 8.9, Grimes Golden 4.9, Northwestern Greening 4.3. *Kansas.*—Ben Davis 19.4, Winesap 15.3, Jonathan 13.8, Missouri Pippin 8.6, Gano 6.0, Maiden Blush 4.3. *Colorado.*—Ben Davis 26.3, Jonathan 18.3, Gano 7.8, Rome Beauty 4.8, Winesap 4.1. *Massachusetts.*—Baldwin 48.4, Rhode Island Greening 9.3, Gravenstein 5.7, McIntosh Red 5.7, Northern Spy 5.1. *Nebraska.*—Ben Davis 21.3, Winesap 13.6, Jonathan 9.4, Wealthy 6.2, Oldenburg 5.8, Grimes Golden 4.8, Missouri Pippin 4.2, Gano 4.0. *Wisconsin.*—Oldenburg 14.7, Wealthy 13.7, Northwestern Greening 11.1, Fameuse (Snow) 8.0, Wolf River 7.5, Ben Davis 5.1, Golden Russet 4.2. *Maryland.*—Ben Davis 17.0, York Imperial 16.2, Baldwin 8.8, Winesap 7.6, Stayman Winesap 7.0, Arkansas Black 4.4, Early Harvest 4.2. *New Jersey.*—Baldwin 25.2, Ben Davis 14.5, Rome Beauty 5.0, Early Harvest 4.7, Rhode Island Greening 4.3, Northern Spy 4.2. *Vermont.*—Baldwin 15.1, Rhode Island Greening 12.8, Northern Spy 12.0, Fameuse (Snow) 8.1, McIntosh 6.1, Ben Davis 5.6, Yellow Bellflower 4.2. *Connecticut.*—Baldwin 42.2, Rhode Island Greening 16.9, Golden Russet 5.2. *New Hampshire.*—Baldwin 51.9, Rhode Island Greening 5.9, Northern Spy 5.2, McIntosh 4.4. *Idaho.*—Jonathan 21.3, Rome Beauty 16.6, Ben Davis 13.1, Gano 7.8, Winesap 4.6. *Oklahoma.*—Ben Davis 25.8, Missouri Pippin 12.1, Jonathan 8.2, Winesap 8.1, Arkansas Black 5.6, Gano 4.0. *Georgia.*—Horse 14.3, Ben Davis 12.2, Red June 10.0, Limbertwig 8.8, Winesap 7.6, Early Harvest 6.1, Arkansas Black 1.6.

PEACHES.

TABLE 164.—*Peaches: Production and prices, by States, 1917–1920.*

State.	Total crop (000 omitted).				Price per bushel, Sept. 15.			
	1920	1919	1918	1917	1920	1919	1918	1917
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
New Hampshire	0	39	0	46	....	210	....	185
Massachusetts	4	136	0	144	....	220	....	200
Connecticut	10	188	0	390	425	250	....	170
New York	2,307	1,648	700	4,823	225	270	310	140
New Jersey	1,056	1,018	832	990	220	270	280	170
Pennsylvania	1,744	1,200	720	1,848	250	300	275	170
Delaware	248	277	136	324	235	190	240	125
Maryland	897	731	235	1,038	210	190	240	120
Virginia	1,470	928	510	928	185	200	180	160
West Virginia	992	760	680	900	225	220	180	175
North Carolina	1,909	713	1,150	1,978	184	210	160	125
South Carolina	1,110	520	998	1,030	200	220	167	120
Georgia	3,799	5,895	6,092	3,668	171	250	150	160
Ohio	2,241	428	174	341	215	330	300	215
Indiana	957	150	0	518	258	330	340	210
Illinois	1,350	790	0	461	317	270	350	195
Michigan	1,500	480	85	744	230	310	350	200
Iowa	135	3	0	....	347	330	330	220
Missouri	798	828	0	728	254	200	330	135
Nebraska	5	0	0	....	403	310	330	235
Kansas	70	80	0	....	400	260	350	195
Kentucky	1,560	726	110	1,100	225	240	275	150
Tennessee	1,000	1,280	833	595	180	180	170	120
Alabama	1,508	1,678	2,440	1,281	175	170	110	145
Mississippi	425	800	....	....	175	150	150	120
Texas	480	2,760	2,333	1,728	310	180	175	170
Oklahoma	61	1,007	167	798	250	140	190	135
Arkansas	117	1,280	217	1,824	235	160	190	125
Colorado	585	840	959	1,096	250	250	200	200
New Mexico	6	122	34	124	....	200	235	195
Utah	825	1,500	1,050	1,365	250	160	150	130
Idaho	40	350	51	211	290	180	190	120
Washington	423	2,309	575	1,747	280	170	160	100
Oregon	100	514	93	273	330	140	200	110
California	13,800	17,600	11,920	15,724	190	150	140	100
Other States	165	....	....	....	....	....	....	....
United States	43,697	49,578	33,094	48,765	....	....	....	....

PEACHES—Continued.

TABLE 165.—*Peaches: Total production (bushels) in the United States, 1899–1920.*

Year.	Production.	Year.	Production.	Year.	Production.
1899 [1]	*15,433,000*	1906	44,104,000	1913	39,707,000
1900	49,438,000	1907	22,527,000	1914	54,109,000
1901	46,445,000	1908	48,145,000	1915	64,097,000
1902	37,831,000	1909 [1]	*35,470,000*	1916	37,505,000
1903	28,850,000	1910	48,171,000	1917	48,765,000
1904	41,070,000	1911	34,880,000	1918	33,094,000
1905	36,634,000	1912	52,343,000	1919	49,578,000
				1920	43,697,000

[1] Census figures.

TABLE 166.—*Peaches: Farm price, cents per bushel on 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Apr. 15										130.0
May 15										152.0
June 15	236.8	191.1	134.0	170.3	119.6				119.2	135.0
July 15	226.9	201.6	169.4	144.8	109.1	99.5	120.4	130.5	112.1	151.0
Aug. 15	235.0	199.6	178.9	143.3	114.9	85.4	105.0	126.2	108.3	138.0
Sept. 15	219.8	205.7	185.3	143.8	118.3	81.1	102.2	136.3	110.0	129.0
Oct. 15	244.2	211.7	193.2	160.6	112.1	85.2	105.3	145.0	105.0	131.0
Nov. 15										125.0
Dec. 15										142.0

TABLE 167.—*Estimated production of the commercial peach crop, 1917 to 1920.*

State.	1920	1919	1918	1917
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
N. H	1,000	11,000	0	14,000
Mass	2,000	49,000	0	36,000
Conn	17,000	53,000	0	273,000
N. Y	1,730,000	780,000	525,000	3,617,000
N. J	834,000	683,000	640,000	711,000
Pa	610,000	467,000	258,000	665,000
Del	159,000	175,000	101,000	166,000
Md	556,000	287,000	144,000	639,000
Va	191,000	201,000	90,000	119,000
W. Va	665,000	529,000	459,000	675,000
N. C	153,000	92,000	90,000	150,000
S. C	103,000	35,000	102,000	113,000
Ga	2,127,000	2,964,000	3,255,000	1,512,000
Ohio	919,000	173,000	87,000	188,000
Ind	77,000	14,000	0	31,000
Ill	256,000	261,000	0	171,000
Mich	638,000	120,000	54,000	336,000
Mo	152,000	139,000	0	218,000
Ky	62,000	15,000	4,000	44,000
Tenn	155,000	119,000	100,000	65,000
Ala	75,000	109,000	138,000	69,000
Tex	158,000	880,000	767,000	456,000
Okla	22,000	345,000	77,000	287,000
Ark	34,000	1,360,000	87,000	849,000
Colo	439,000	676,000	719,000	822,000
N. Mex	5,000	75,000	27,000	99,000
Utah	578,000	830,000	735,000	956,000
Idaho	33,000	163,000	42,000	158,000
Wash	497,000	1,417,000	402,000	1,223,000
Oreg	46,000	171,000	31,000	114,000
Calif. [1]	13,486,000	16,268,000	11,663,000	14,151,000
U. S	24,780,000	29,461,000	20,597,000	28,927,000

[1] Attention is called to the fact that approximately 90 per cent of the California peach crop is either canned or dried.

PEARS.

TABLE 168.—*Pears: Production and prices, 1917–1920.*

State.	Total crop (000 omitted).				Price per bushel Nov. 15.			
	1920	1919	1918	1917	1920	1919	1918	1917
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Maine	30	44	20	24	....	....	....	....
New Hampshire	25	25	15	19	225	....	....	....
Vermont	19	18	13	14	280	....	....	....
Massachusetts	109	115	77	71	250	....	....	....
Rhode Island	12	12	10	7	....	....	175	....
Connecticut	47	47	34	29	....	....	175	....
New York	2,375	1,530	1,352	1,708	105	240	150	140
New Jersey	843	500	650	590	110	140	110	75
Pennsylvania	701	355	518	448	130	230	135	120
Delaware	287	200	238	294	25	....	80	65
Maryland	616	420	455	525	60	130	100	70
Virginia	296	190	119	194	95	160	120	115
West Virginia	66	40	33	33	175	230	200	135
North Carolina	184	84	108	150	161	210	150	125
South Carolina	98	81	98	100	....	220	140	125
Georgia	148	152	188	140	145	180	150	135
Florida	30	70	132	46	....	....	....	100
Ohio	662	218	304	334	120	260	170	125
Indiana	663	188	260	410	99	180	175	100
Illinois	603	381	302	456	125	170	160	95
Michigan	1,100	426	704	1,080	90	180	125	121
Wisconsin	26	....	....	....	175	....	....	....
Iowa	120	58	32	82	145	190	....	145
Missouri	272	280	112	265	150	140	190	125
Nebraska	14	16	6	14	275	250	....	175
Kansas	22	120	38	140	215	170	200	170
Kentucky	308	128	140	204	195	180	175	125
Tennessee	146	72	112	75	165	200	150	170
Alabama	110	114	152	80	164	160	130	150
Mississippi	100	75	136	30	200	160	105	105
Louisiana	40	50	52	52	175	....	120	115
Texas	205	385	246	280	231	140	150	160
Oklahoma	12	70	38	45	....	190	240	150
Arkansas	38	93	64	102	190	170	180	125
Montana	14	15	6	11	200	300	....	....
Colorado	338	290	194	320	190	220	150	210
New Mexico	32	67	56	46	250	230	....	....
Arizona	12	22	19	21	....	380	384	....
Utah	60	47	51	48	250	....	160	120
Nevada	7	5	6	6	300	....	....	....
Idaho	83	70	60	70	276	....	150	150
Washington	2,246	3,326	1,300	595	130	170	115	115
Oregon	560	553	672	600	175	150	125	130
California	3,600	4,520	4,240	3,523	275	160	140	100
United States	17,279	15,472	13,362	13,281	....	....	....	....

PEARS—Continued.

TABLE 169.—*Pears: Total production (bushels) in the United States, 1909–1920.*

Year.	Production.	Year.	Production.
1909 [1]	*8,841,000*	1915	11,216,000
1910	10,431,000	1916	11,874,000
1911	11,450,000	1917	13,281,000
1912	11,843,000	1918	13,362,000
1913	10,108,000	1919	15,472,000
1914	12,086,000	1920	17,279,000

[1] Census figures.

TABLE 170.—*Pears: Farm price, cents per bushel on 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15				119.8	92.4	100.4	113.3	108.0		
Feb. 15										
Mar. 15										108.9
Apr. 15										134.0
May 15										138.6
June 15									113.2	126.0
July 15									122.0	128.0
Aug. 15	195.5	188.4	168.4	132.2	109.0	80.8	98.8	109.9	106.3	118.0
Sept. 15	197.9	183.0	157.8	125.0	102.7	83.8	92.8	119.3	100.0	103.8
Oct. 15	184.2	181.3	147.5	118.2	96.9	82.7	80.4	95.6	83.1	97.2
Nov. 15	170.0	182.0	140.1	116.1	93.3	89.8	77.5	93.0	79.3	85.1
Dec. 15	164.5	219.5	156.6		105.6	89.7	82.5	97.9	92.8	111.0

ORANGES.

TABLE 171.—*Oranges: Production and value, 1915–1920.*

Year.	United States.			Florida.			California.		
	Production (000 omitted).	Average price per box Dec. 1.	Farm value Dec. 1 (000 omitted).	Production (000 omitted).	Average price per box Dec. 1.	Farm value Dec. 1 (000 omitted).	Production (000 omitted).	Average price per box Dec. 1.	Farm value Dec. 1 (000 omitted).
	Boxes.	*Dollars.*	*Dollars.*	*Boxes.*	*Dollars.*	*Dollars.*	*Boxes.*	*Dollars.*	*Dollars.*
1915	21,200	2.39	50,692	6,150	1.88	11,562	15,050	2.60	39,130
1916	24,433	2.52	61,463	6,933	2.05	14,213	17,500	2.70	47,250
1917	10,593	2.60	27,556	3,500	2.30	8,050	7,093	2.75	19,506
1918	24,200	3.49	84,480	5,700	2.65	15,105	18,500	3.75	69,375
1919	22,075	2.67	58,956	7,000	2.50	17,500	15,075	2.75	41,456
1920	27,200	2.58	70,125	8,500	2.20	18,700	18,700	2.75	51,425

CRANBERRIES.

TABLE 172.—*Cranberries: Acreage, production, and farm value, by States, 1920, and totals, 1914–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per barrel Dec. 1.	Farm value Dec. 1.
	Acres.	*Barrels.*	*Barrels.*	*Dollars.*	*Dollars.*
Massachusetts	13,200	20.8	275,000	13.50	3,712,000
New Jersey	9,800	12.4	122,000	10.50	1,281,000
Wisconsin	1,900	17.9	34,000	9.40	320,000
Total of above	24,900	17.3	431,000	12.32	5,313,000
1919	25,600	22.1	566,000	8.37	4,735,000
1918	25,400	13.9	352,000	10.77	3,791,000
1917	18,200	13.7	249,000	10.24	2,550,000
1916	26,200	18.0	471,000	7.32	3,449,000
1915	23,100	19.1	441,000	6.59	2,908,000
1914	22,000	31.7	697,000	3.97	2,766,000

HOPS.

TABLE 173.—*Hops: Area and production in undermentioned countries, 1909–1919.*

Country.	Area.				Production.			
	Average[1] 1909–1913	1917	1918	1919	Average[1] 1909–1913	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
United States[2]	....	30	26	24	53,655	29,388	21,481	29,346
Canada	1	....	....	....	1,208	....	....	....
Total	....	....	....	....	54,863	....	....	....
EUROPE.								
Austria	[3] 50	([4])	([4])	([4])	[3] 27,523	268	139	[8] 104
Hungary[3]	5	....	....	....	2,932	....	....	....
Croatia-Slavonia[3]	1	....	....	....	263	....	....	....
Belgium	6	....	....	3	7,096	....	....	1,940
France[3]	7	4	3	[5] 3	6,948	4,354	924	[5] 1,854
Germany[3]	67	33	27	[6] 20	30,105	20,621	1,833	[6] 8,532
Russia	....	....	....	....	[3] 11,765	....	....	....
United Kingdom, England	36	17	16	[7] 17	33,058	24,721	14,560	[7] 21,164
Total Europe	172	....	....	....	119,690	....	....	....
Australia	1	1	1	....	1,564	1,752	2,103	....
Grand total	174	....	....	....	176,117	....	....	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Four States.
[3] Old boundaries.
[4] Less than 500 acres.
[5] Excludes Alsace-Lorraine
[6] Excludes Alsace-Lorraine and Posen.
[7] Includes Wales.
[8] Unofficial.

TABLE 174.—*Hops: World production so far as reported, 1895–1915.*

Year.	Production.	Year.	Production.	Year.	Production.
	Pounds.		*Pounds.*		*Pounds.*
1895	204,894,000	1902	170,063,000	1909	128,173,000
1896	168,509,000	1903	174,457,000	1910	188,951,000
1897	189,219,000	1904	178,802,000	1911	163,810,000
1898	166,100,000	1905	277,260,000	1912	224,493,000
1899	231,563,000	1906	180,998,000	1913	174,642,000
1900	174,683,000	1907	215,923,000	1914	224,179,000
1901	201,902,000	1908	230,220,000	1915	163,081,000

HOPS—Continued.

TABLE 175.—*Hops: Acreage, production, and value by States in 1920, and totals, 1915–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per pound Nov. 15.	Farm value Nov. 15.
	Acres.	*Pounds.*	*Pounds.*	*Cents.*	*Dollars.*
New York	2,200	1,040	2,288,000	60	1,373,000
Washington	3,000	1,910	5,730,000	35	2,006,000
Oregon	12,000	825	9,900,000	35	3,465,000
California	12,000	1,750	21,000,000	35	7,350,000
Total	29,200	1,332.8	38,918,000	36.5	14,191,000
1919	25,900	1,133.1	29,346,000	77.2	22,656,000
1918	25,900	829.4	21,481,000	19.3	4,150,000
1917	29,900	982.9	29,388,000	33.3	9,795,000
1916	43,900	1,152.5	50,595,000	12.0	6,073,000
1915	44,653	1,186.6	52,986,000	11.7	6,203,000

TABLE 176.—*Hops: Farm price, cents per pound on 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15		31.0		11.8	13.0	14.8	26.6	19.7	41.8	19.3
Feb. 15		32.5			12.0	11.1	19.1	16.9	38.8	17.8
Mar. 15		32.2			13.5	12.0	20.5		40.1	19.2
Apr. 15					14.3	12.4	20.6	15.0		18.2
May 15					12.7	10.9	21.8	13.4	37.2	20.9
June 15					10.5	9.6		14.1		22.6
July 15					10.1	10.5	14.7	14.8	28.9	25.8
Aug. 15				25.9		15.0	20.0		18.8	36.5
Sept. 15	62.8	56.6		36.5	16.4	15.8	24.4	20.9	19.8	40.6
Oct. 15	50.6		12.7	42.7	21.0	14.8	19.1	29.5	22.2	37.8
Nov. 15	36.5	77.0	19.7	33.7	21.5	13.8	15.6	26.0	19.7	41.4
Dec. 15	30.8	77.2	19.3	33.3	18.2	12.3	13.2	29.4	17.8	42.5

TABLE 177.—*Hop consumption and movement, 1910–1920.*

[The total hop movement of the United States for the last 11 years is shown. The figures on the quantity consumed by brewers have been compiled from the records of the Treasury Department; exports and imports are as reported by the Department of Commerce.]

Year ending June 30—	Consumed by brewers.	Exports.		Total of brewers' consumption and exports.	Imports.	Net domestic movement.
		Domestic.	Foreign.			
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1920	[1] 6,440,894	30,779,508	104,198	37,324,600	2,696,264	34,628,336
1919	13,924,650	7,466,952	4,719	21,396,321	6	21,396,315
1918	33,481,415	3,494,579	37,823	37,013,817	121,288	36,892,529
1917	41,949,225	4,874,876	26,215	46,850,316	236,849	46,613,467
1916	37,451,610	22,409,818	134,571	59,995,999	675,704	59,320,295
1915	38,839,294	16,210,443	16,947	55,066,684	11,651,332	43,415,352
1914	43,987,623	24,262,896	30,224	68,280,743	5,382,025	62,898,718
1913	44,237,735	17,591,195	35,859	61,864,789	8,491,144	53,370,615
1912	42,436,665	12,190,663	35,869	54,663,197	2,991,125	51,672,072
1911	45,068,811	13,104,774	17,974	58,191,559	8,557,531	49,634,028
1910	43,293,764	10,589,254	14,590	53,897,608	3,200,560	50,697,048

[1] Including hops used to make cereal beverages.

HOPS—Continued.

Table 178.—*Hops: Wholesale price per pound, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York, choice State.			San Francisco.								
				Sacramento Valley, choice.			Willamette Valley, choice.[1]			Eastern Washington, choice.[2]		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January–June	17	32	......	18	20	......	19	21	......	19	21	......
July–December	17	48	......	18	28	......	18	30	......	19	30	......
1914.												
January–June	36	48	......	16	28	......	16	30	......	16	30	......
July–December	23	50	......	10	19	......	11	20	......	10	20	......
1915.												
January–June	13	25	......	09	15	......	10	16	......	10	15	......
July–December	13	30	......	07½	14	......	10	16	......	10	15	......
1916.												
January–June	18	27	......	07½	11	......	09	12½	......	09	12½	......
July–December	15	55	......	08	14	......	07	14	......	07	14	......
1917.												
January–June	34	50	......	05	10½	......	07	11	......	06	11½	......
July–December	34	90	......	05	37½	......	07	40	......	06	40	......
1918.												
January–June	40	54	42.6	15	20	16.1	15	20	19.0	19	22½	19.8
July–December	23	42	33.2	15	15	15.0	19	19	19.0	19	19	19.0
1919.												
January–June	37	63	42.8	30	42	35.8	35	50	40.9	34	45	39.4
July–December	63	85	76.9	52	90	74.0	48	85	67.4	84	84	74.0
1920.												
January	80	85	82.5	......	......	......	......	......	......	......	......	......
February	89	85	82.5	72	73	72.5	75	75	75.0	......	......	......
March	80	90	83.5	72	73	72.5	75	75	75.0	50	60	55.0
April	90	105	98.9	63	63	63.0	65	65	65.0	50	75	72.9
May	100	105	102.5	......	......	......	......	......	......	......	......	......
June	95	105	98.8	......	......	......	......	......	......	......	......	......
January–June	80	105	91.4	63	73	69.3	65	75	71.7	50	75	64.0
July	93	100	95.2	......	......	......	......	......	......	70	80	75.0
August	76	95	85.8	......	......	......	......	......	......	60	85	72.5
September	65	80	70.9	......	......	......	......	......	......	60	85	68.7
October	53	80	61.0	......	......	......	......	......	......	40	75	64.1
November	53	55	54.0	......	......	......	......	......	......	40	60	50.0
December	41	55	46.6	......	......	......	......	......	......	33	60	35.0
July–December	41	100	68.9	......	......	......	......	......	......	33	85	60.9

[1] Called "Oregon" hops in 1916; Sonoma hops for 1919.
[2] Called "Washington" hops in 1916; Oregon hops for January–March, 1919. "1920 crop," 1920.

HOPS—Continued.

TABLE 179.—*Hops: International trade, calendar years 1909–1919.*[1]

[Lupulin and hopfenmehl (hop meal) are not included with hops in the data shown. See "General note," Table 112.]

EXPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Austria-Hungary	18,333	....	....	....	....	....	....
Belgium	4,814	....	....	....	....	....	2,651
France	335	212	1,259	1,432	491	612	1,620
Germany	17,564	....	....	....	....	....	....
Netherlands	1,405	1,301	1,120	236	41	26	1,471
New Zealand	352	389	486	488	314	225	....
Russia	2,348	254	485	542	....	....	....
United Kingdom	2,162	1,117	928	1,206	1,453	775	287
United States	15,416	11,056	20,864	13,506	4,138	3,670	20,798
Other countries	212	44	388	855	202	221	....
Total	62,941	14,373	25,530	18,265	6,639	5,529	....

IMPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Australia	1,106	1,058	994	767	110	598	....
Austria-Hungary	938	....	....	....	....	....	....
Belgium	6,915	....	....	....	....	....	8,092
British India	246	118	141	275	336	532	....
British South Africa	391	443	453	446	442	570	543
Canada	1,396	1,613	955	781	790	849	1,780
Denmark	1,027	1,633	1,250	1,263	1,459	2,147	....
France	5,436	2,358	102	709	1,238	888	2,859
Germany	7,688	....	....	....	....	....	....
Netherlands	2,938	3,287	3,484	2,257	2,205	4,612	1,178
Russia	1,258	235	(2)	....	....	....	....
Sweden	987	1,428	1,286	1,201	1,230	4,151	835
Switzerland	1,257	1,420	967	779	469	300	166
United Kingdom	21,028	9,362	22,327	16,369	955	....	17,258
United States	6,235	7,483	6,767	631	194	77	467
Other countries	4,123	3,250	2,792	2,432	3,025	2,407	....
Total	62,969	33,688	41,518	28,910	12,453	17,131	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 pounds.

BEANS.

TABLE 180.—*Beans: Area and production in undermentioned countries, 1909-1919.*

Country.	Area.				Production.			
	Average[1] 1909-1913.	1917	1918	1919	Average[1] 1909-1913.	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States (6 States)	788	1,821	1,744	1,018	11,166	16,045	17,397	11,935
Canada:								
Nova Scotia	1	1	9	7	32	18	143	87
New Brunswick	2	(2)	5	7	21	6	86	106
Quebec	6	55	110	43	125	827	1,867	853
Ontario	42	36	100	23	796	423	1,388	289
Other	....	....	4	4	....	....	80	51
Total Canada	51	92	228	84	974	1,274	3,564	1,389
Mexico	....	....	....	....	....	....	[8] 4,858	....
SOUTH AMERICA.								
Argentina	65	....	....	....	....	....	....	....
Brazil	....	....	....	....	....	13,139	....	....
Chile	79	[3] 87	[3] 132	....	1,398	[3] 950	[3] 1,386	[3] 1,713
EUROPE.								
Austria	[4] 648	17	9	7	[4] 9,666	165	82	68
Hungary [4]	[5] 44	....	....	....	[5] 599	....	....	....
Do.[4]	[6] 1,471	....	....	....	[6] 6,917	....	....	....
Croatia-Slavonia [4]	[5] 25	....	....	....	[5] 265	....	....	....
Do.[4]	[6] 472	....	....	....	[6] 2,011	....	....	....
Belgium	21	....	....	....	604	....	....	....
Bulgaria [4]	178	....	....	....	1,895	....	....	....
Denmark	9	11	....	....	369	269	....	....
France [4]	554	489	349	333	9,518	5,955	5,284	4,753
Italy	2,023	1,087	1,065	[3] 979	21,038	12,945	15,362	....
Luxemburg	4	....	....	....	73	....	....	....
Netherlands	64	92	61	38	1,853	2,526	2,095	....
Roumania [4]	[5] 93	....	....	....	[5] 1,385	....	....	....
Do.[4]	[6] 1,265	....	....	....	[6] 3,630	....	....	....
Russia, proper [4]	523	....	....	....	6,027	....	....	....
Poland [4]	29	....	....	....	505	....	....	....
Northern Caucasia [4]	4	....	....	....	58	....	....	....
Serbia [4]	25	....	....	....	1,676	....	....	....
Spain	1,132	[3] 519	[3] 489	....	11,908	[3] 7,892	[3] 7,371	[3] 6,135
Sweden	10	5	6	6	174	91	182	110
United Kingdom:								
England	276	202	248	282	8,015	3,462	7,032	6,776
Wales	1	1	3	3	33	29	78	62
Scotland	9	6	[7] 7	[7] 7	318	237	266	262
Ireland	2	1	[8] 2	[8] 2	67	65	75	....
Total	288	210	260	294	8,433	3,793	7,451	....
ASIA.								
British India	13,156	15,307	16,255	7,367	143,360	127,979	165,275	71,701
Japanese Empire:								
Japan	1,598	1,481	1,462	....	23,175	25,564	23,998	....
Formosa	79	83	....	....	[9] 657	661	....	....
Korea (Chosen)	1,229	1,662	....	....	14,240	19,235	....	....
Total	2,906	3,226	....	....	38,072	45,460	....	....
Russia (9 Governments)	[4] 22	....	....	....	[4] 225	....	....	....
AFRICA.								
Algeria	110	....	....	....	1,132	....	....	....
Egypt	514	490	494	434	....	12,176	12,816	10,283
AUSTRALASIA.								
Australia	40	1	2	....	794	19	43	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Less than 500 acres.
[3] Unofficial.
[4] Old boundaries.
[5] Grown alone.
[6] Grown with corn.
[7] Field beans only.
[8] Includes peas.
[9] Includes other pulse.

BEANS—Continued.

TABLE 181.—*Beans (dry): Acreage, production, and value by States 1920, and totals, 1914–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Dollars.*	*Dollars.*
New York	90,000	14.0	1,260,000	3.50	4,410,000
Michigan	275,000	13.0	3,575,000	2.50	8,938,000
Colorado	63,000	8.0	504,000	3.15	1,588,000
New Mexico	121,000	6.7	811,000	3.04	2,465,000
Arizona	15,000	5.0	75,000	4.10	308,000
California	285,000	10.0	2,850,000	3.30	9,405,000
Total	849,000	10.7	9,075,000	2.99	27,114,000
1919	1,002,000	11.9	11,935,000	4.28	51,051,000
1918	1,744,000	10.0	17,397,000	5.28	91,863,000
1917	1,821,000	8.8	16,045,000	6.50	104,350,000
1916	1,107,000	9.7	10,715,000	5.10	54,686,000
1915	928,000	11.1	10,321,000	2.59	26,771,000
1914	875,000	13.2	11,585,000	2.26	26,213,000

TABLE 182.—*Beans: Farm price per bushel on 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$4.70	$4.98	$7.00	$5.71	$3.47	$2.63	$2.17	$2.26	$2.38	$2.20	$3.75
Feb. 15	4.47	4.52	7.08	6.07	3.43	3.02	2.09	2.19	2.38	2.23	3.75
Mar. 15	4.32	4.40	6.95	6.49	3.34	2.89	2.05	2.10	2.42	2.17	3.71
Apr. 15	4.41	4.44	6.95	7.37	3.42	2.81	2.11	2.11	2.37	2.20	3.82
May 15	4.36	4.19	6.67	8.94	3.56	2.93	2.31	2.18	2.52	2.17	3.98
June 15	4.49	4.39	6.28	8.99	3.72	2.87	2.23	2.23	2.62	2.19	4.00
July 15	4.47	4.25	5.88	8.07	5.09	2.75	2.22	2.22	2.47	2.23	3.96
Aug. 15	4.17	4.30	6.11	7.29	4.59	2.67	2.54	2.11	2.40	2.20	3.84
Sept. 15	3.83	4.36	5.67	6.69	4.60	2.70	2.46	2.08	2.38	2.26	3.70
Oct. 15	3.46	4.27	5.52	7.48	4.47	2.93	2.17	2.25	2.34	2.27	3.72
Nov. 15	3.27	4.42	5.46	7.33	5.53	3.03	2.28	2.20	2.25	2.34	3.81
Dec. 15	2.99	4.41	4.86	7.00	5.77	3.30	2.40	2.12	2.31	2.42	3.76

BEANS—Continued.

TABLE 183.—*Beans: Wholesale price per bushel, 1913–1920.*

[Compiled from commercial papers.]

Date.	Boston, pea.			Chicago, pea.[1]			Detroit, pea. (100 lbs.).			San Francisco, small white (per 100 lbs.).		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
January–June	2.25	2.60	2.45	1.25	2.50	1.86	1.80	2.20	......	4.50	5.90	4.91
July–December	2.15	2.40	2.28	1.15	2.25	1.76	1.75	2.05	......	4.50	6.00	5.41
1914.												
January–June	2.10	2.35	2.20	1.60	2.30	1.99	1.80	2.10	......	4.75	5.50	5.15
July–December	2.15	3.10	2.59	1.95	3.10	2.44	1.85	2.90	......	4.00	6.00	4.81
1915.												
January–June	2.95	3.50	3.24	2.40	3.50	3.08	2.15	3.20	2.98	4.50	5.70	5.40
July–December	2.85	4.10	3.47	2.62	4.10	3.30	2.60	3.60	3.15	4.50	6.40	5.19
1916.												
January–June	3.80	5.85	4.08	3.00	8.00	3.94	3.50	6.00	3.86	6.25	11.50	6.70
July–December	4.50	7.25	5.83	5.00	8.00	6.34	4.90	7.00	5.77	7.50	11.00	9.40
1917.												
January–June	6.50	10.25	8.23	6.40	11.25	8.47	6.25	10.00	7.97	10.50	16.00	13.21
July–December	8.00	15.00	10.26	7.25	14.50	9.71	7.25	13.25	9.24	11.75	15.75	13.20
1918.												
January–June	12.00	14.50	13.37	10.00	15.00	12.61	9.50	13.25	11.64	11.75	12.75	12.35
July–December	9.00	12.00	10.78	8.25	12.50	10.37	8.63	10.25	9.27	8.90	12.25	10.94
1919.												
January–June	6.50	10.00	7.92	6.50	9.25	7.70	6.50	9.00	7.64	5.75	8.90	7.14
July–December	6.00	9.00	7.57	7.25	9.50	8.13	6.75	8.75	7.43	6.20	8.00	6.96
1920.												
January	7.00	8.25	7.51	7.50	8.00	7.76	7.20	7.35	7.24	6.20	6.75	6.64
February	7.00	8.25	7.62	7.00	8.00	7.40	6.60	7.25	6.83	6.40	6.75	6.53
March	7.00	8.25	7.46	6.75	7.25	7.04	6.50	6.75	6.58	6.40	6.40	6.40
April	7.00	8.00	7.29	6.75	7.50	7.16	6.60	7.50	7.12	5.75	6.50	5.94
May	7.25	8.00	7.62	7.00	9.25	7.58	7.75	7.90	7.81	6.00	6.50	6.20
June	7.25	8.00	7.62	7.00	8.50	8.07	7.25	7.85	7.48	6.40	6.40	6.40
January–June	7.00	8.25	7.52	6.75	9.25	7.50	6.50	7.90	7.18	5.75	6.75	6.35
July	7.00	8.00	7.59	6.50	7.50	7.18	6.75	7.25	7.04	5.50	6.40	6.29
August	6.50	7.75	6.99	6.50	7.00	6.75	6.09	6.75	6.27	5.50	6.00	5.72
September	6.50	7.25	6.88	6.50	7.00	6.75	5.00	6.00	5.58	5.25	6.00	5.58
October	5.20	7.25	6.36	4.75	7.00	6.13	4.40	5.00	4.70	4.25	5.50	4.56
November	5.00	6.00	5.67	4.50	5.00	4.82	4.10	4.65	4.42	4.25	4.50	4.38
December	4.75	5.75	5.14	4.25	4.75	4.52	3.90	4.00	3.99	3.75	4.50	4.19
July–December	4.75	8.00	6.44	4.25	7.50	6.02	3.90	7.25	5.33	3.75	6.40	5.12

[1] Hand picked, choice to fancy.

SOY BEANS.

TABLE 184.—*Soy beans: Acreage, production, and value, by States 1920, and totals, 1917–1920.*

[Leading producing States.]

State and year.	Acreage.[1]	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Dollars.*	*Dollars.*
Virginia	30,000	19.0	570,000	3.10	1,767,000
North Carolina	91,000	18.0	1,638,000	2.78	4,554,000
Georgia	2,000	11.0	22,000	3.35	74,000
Ohio	8,000	8.0	64,000	4.00	256,000
Indiana	3,000	14.0	42,000	5.00	210,000
Illinois	8,000	11.5	92,000	3.92	361,000
Wisconsin	4,000	7.0	28,000	4.00	112,000
Missouri	7,000	19.0	133,000	2.60	346,000
Kentucky	8,000	15.0	120,000	3.50	420,000
Tennessee	5,000	10.0	50,000	2.85	142,000
Alabama	23,000	9.9	228,000	4.00	912,000
Mississippi	1,000	15.0	15,000	3.00	45,000
Total	190,000	15.8	3,002,000	3.06	9,199,000
1919	175,000	14.1	2,460,000	3.47	8,530,000
1918	169,000	17.7	2,997,000	3.20	9,590,000
1917	154,000	14.8	2,283,000	2.86	6,529,000

[1] Acres rounded to nearest thousands.

TABLE 185.—*Soy beans: Farm price per bushel on 15th of month, 1913–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913
Jan. 15	$3.76	$3.00	$3.47	$2.20	$2.31	$2.35	$1.96	....
Feb. 15	4.05	3.00	3.82	2.45	2.39	2.26	1.80	....
Oct. 15	3.41	3.34	3.36	2.73	2.13	1.88	2.08	$1.96
Nov. 15	3.00	3.35	3.20	2.86	2.13	2.08	2.15	1.57
Dec. 15	2.28	3.44	3.29	3.33	2.18	2.23	2.24	1.72

COWPEAS.

TABLE 186.—*Cowpeas: Acreage, production, and value, by States 1920, and totals 1917–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
Virginia	63,000	11.0	693,000	290	2,010,000
North Carolina	202,000	11.6	2,343,000	257	6,022,000
South Carolina	100,000	9.0	900,000	225	2,025,000
Georgia	110,000	9.0	990,000	217	2,148,000
Florida	23,000	8.0	184,000	275	506,000
Indiana	7,000	16.0	112,000	300	336,000
Missouri	25,000	12.0	300,000	200	600,000
Kentucky	21,000	12.0	252,000	375	945,000
Tennessee	8,000	5.0	40,000	240	96,000
Alabama	532,000	9.6	5,107,000	200	10,214,000
Mississippi	300,000	8.0	2,400,000	212	5,088,000
Louisiana	141,000	7.3	1,029,000	261	2,686,000
Texas	65,000	11.0	715,000	285	2,038,000
Arkansas	86,000	5.0	430,000	245	1,054,000
Total	1,683,000	9.2	15,495,000	230.8	35,768,000
1919	1,453,000	6.5	9,423,000	274.5	25,865,000
1918	2,003,000	6.2	12,427,000	231.4	28,756,000
1917	1,829,000	7.0	12,787,000	227.1	29,039,000

COWPEAS—Continued.

TABLE 187.—*Cowpeas: Farm price, cents per bushel, on 15th of month, 1916–1920.*

Date.	1920	1919	1918	1917	1916	Date.	1920	1919	1918	1917	1916
Jan. 15	312.9	238.9	262.2	192.2	156.3	July 15	470.8	342.8	248.4	303.2	135.1
Feb. 15	372.4	252.1	292.5	210.0	157.2	Aug. 15	422.7	310.3	241.3	265.4	141.3
Mar. 15	394.0	248.8	301.5	231.8	153.7	Sept. 15	368.8	269.4	226.2	217.0	142.1
Apr. 15	421.4	267.6	292.8	253.4	150.2	Oct. 15	273.7	260.9	233.9	219.5	148.1
May 15	484.4	292.3	283.3	293.1	148.8	Nov. 15	243.4	270.7	231.4	227.1	161.6
June 15	483.7	343.9	257.4	309.1	110.0	Dec. 15	229.0	280.6	237.6	237.5	177.0

PEAS.

TABLE 188.—*Peas: Area and production in undermentioned countries 1909–1919.*

Country.	Area.				Production.			
	Average[1] 1909–1913	1917	1918	1919	Average[1] 1909–1913	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*	*1,000 bushels.*
United States	[2] 1,305	....	....	....	[2] 7,129	....	....	....
Canada:								
Prince Edward Island	1	(3)	(3)	(3)	4	1	7	8
Nova Scotia	1	(3)	2	2	14	2	33	33
New Brunswick	1	(3)	4	5	21	6	60	69
Quebec	33	66	107	82	520	798	1,664	1,225
Ontario	267	126	114	127	4,482	2,110	2,381	1,816
Manitoba	....	....	....	6	....	....	....	81
Saskatchewan	(3)	3	4	5	7	45	85	87
Alberta	(3)	2	2	2	7	32	36	29
British Columbia	1	1	2	2	42	32	47	52
Total	304	198	235	231	5,097	3,026	4,313	3,405
SOUTH AMERICA.								
Chile	[4] 26	[5] 37	[5] 26	....	[4] 387	[5] 521	[5] 544	[5] 429
EUROPE.								
Austria	....	6	4	[6] 4	....	52	50	[5] 59
Hungary [6 7]	32	....	....	....	427	....	....	....
Croatia-Slavonia [6 7]	12	....	....	....	159	....	....	....
Belgium	12	....	....	....	390	....	....	....
France [4 6]	73	28	33	[8] 24	1,308	517	464	[8] 515
Italy	....	....	....	....	[4] 3,829	2,656	....	....
Luxemburg [7]	2	....	....	....	34	....	....	....
Netherlands	65	89	88	[5] 80	1,581	2,529	2,932	....
Roumania [6 7]	42	77	....	16	675	....	....	247
Russia proper [6]	2,628	1,070	....	....	27,973	....	....	....
Poland [6]	383	....	....	....	5,428	....	....	....
Northern Caucasia [6]	11	....	....	....	89	....	....	....
Spain	1,071	[5] 825	[5] 941	....	10,402	[5] 8,962	[5] 8,143	....
Sweden	47	25	36	[6 9] 45	1,227	843	1,885	[5 9] 2,490
United Kingdom:								
England	152	102	127	132	3,974	2,203	3,496	3,520
Wales	1	1	1	1	14	12	15	11
Scotland	1	....	....	(3)	14	1	2	2
Ireland	....	....	[10] 2	[10] 2	8	8	12	....
Total	154	....	130	135	4,010	2,224	3,525	....
ASIA.								
Japan	91	222	169	....	1,804	3,898	2,736	....
Russia (9 governments) [6]	94	....	....	....	794	....	....	....
AUSTRALASIA.								
Australia	(11)	32	41	....	(11)	567	701	....
New Zealand	16	12	12	....	507	242	313	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Census 1909.
[3] Less than 500 acres.
[4] Includes chick peas, lentels, and vetches.
[5] Unofficial.
[6] Old boundaries.
[7] Includes lentils.
[8] Excludes Alsace-Loraine.
[9] Includes beans and vetches.
[10] Includes beans.
[11] Included under beans.

BROOM CORN.

TABLE 189.—*Broom corn: Acreage, production, and value, by States, 1920, and totals 1915–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per ton Nov. 15.	Farm value Nov. 15.
	Acres.	*Pounds.*	*Tons.*	*Dollars.*	*Dollars.*
Illinois	18,200	500	4,600	175.00	805,000
Missouri	4,500	465	1,000	145.00	145,000
Kansas	20,000	375	3,800	89.00	338,000
Texas	33,000	230	3,800	118.00	448,000
Oklahoma	105,500	324	17,100	129.00	2,206,000
Colorado	7,000	370	1,300	70.00	91,000
New Mexico	11,000	420	2,300	100.00	230,000
Total	199,200	340.4	33,900	125.78	4,263,000
1919	262,600	386.9	50,800	153.64	7,805,000
1918	366,000	340.4	62,300	233.87	14,570,000
1917	345,000	332.8	57,400	292.75	16,804,000
1916	235,200	329.3	38,726	172.75	6,690,000
1915	230,100	454.1	52,242	91.67	4,789,000

TABLE 190.—*Broom corn: Farm price per ton on 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15	$162.86	$169.41	$249.39	$184.08	$103.97	$66.26	$94.38	$48.89	$99.96	$81.46
Feb. 15	123.25	140.96	253.70	200.54	103.52	78.44	95.16	56.08	85.97	79.70
Mar. 15	129.66	173.73	242.47	212.24	103.81	68.42	91.36	56.97	99.36	77.96
Apr. 15	144.84	149.46	222.19	226.82	96.39	70.79	89.47	58.13	100.54	74.10
May 15	145.78	151.72	205.98	252.33	100.94	74.84	84.99	53.40	83.34	81.05
June 15	145.14	106.49	222.11	222.66	101.81	76.51	88.04	61.08	79.40	69.36
July 15	112.63	119.02	235.02	193.79	103.06	78.94	87.94	56.61	84.68	68.14
Aug. 15	141.99	123.64	231.68	307.66	119.79	82.96	91.44	90.58	83.12	72.07
Sept. 15	125.22	154.28	300.28	240.15	128.51	75.24	77.05	106.05	76.52	91.67
Oct. 15	125.65	161.86	265.23	269.85	167.52	86.44	66.53	101.85	70.40	121.47
Nov. 15	122.67	160.55	205.35	295.50	172.60	92.04	65.82	99.80	69.33	124.00
Dec. 15	87.59	162.86	171.63	279.55	171.94	101.19	58.21	92.32	57.07	108.20

GRAIN SORGHUMS.

TABLE 191.—*Grain sorghums:*[1] *Acreage, production, and value, by States, 1920, and totals 1915–1919.*

[Leading producing States.]

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
Kansas	1,270,000	21.2	26,924,000	69	18,578,000
Texas	1,906,000	32.0	60,992,000	121	73,800,000
Oklahoma	1,555,000	26.0	40,430,000	60	24,258,000
Colorado	255,000	17.0	4,335,000	84	3,641,000
New Mexico	240,000	27.0	6,480,000	99	6,415,000
Arizona	28,000	26.0	728,000	99	721,000
California	150,000	27.0	4,050,000	105	4,252,000
Total	5,404,000	26.6	143,939,000	91.5	131,665,000
1919	5,031,000	25.4	127,568,000	129.4	165,030,000
1918	6,036,000	12.1	73,211,000	150.0	109,881,000
1917	5,153,000	11.9	61,409,000	161.9	99,433,000
1916	3,944,000	13.7	53,858,000	105.9	57,027,000
1915	4,153,000	27.6	114,460,000	41.7	51,157,000

[1] Kafirs, milo maize, feterita.

GRAIN SORGHUMS—Continued.

TABLE 192.—*Grain sorghums: Farm price, cents per bushel, on 15th of month, 1916-1920.*

Date.	1920	1919	1918	1917	1916	Date.	1920	1919	1918	1917	1916
Jan. 15	137.3	153.7	170.8	119.1	....	July 15	135.2	175.9	165.6	214.0	62.8
Feb. 15	138.7	156.9	185.7	129.0	....	Aug. 15	150.0	176.9	177.2	243.3	72.4
Mar. 15	129.8	150.9	193.5	147.0	....	Sept. 15	124.8	153.7	181.0	187.7	83.8
Apr. 15	145.4	162.1	204.0	152.0	53.6	Oct. 15	95.5	139.7	175.9	174.1	80.8
May 15	154.5	173.6	211.0	188.0	58.2	Nov. 15	95.5	133.6	150.5	160.6	102.4
June 15	153.9	174.1	179.6	206.3	60.0	Dec. 15	81.7	144.3	154.8	166.7	101.5

PEANUTS.

TABLE 193.—*Peanuts: Acreage, production, and value, by States, 1920, and totals 1916-1919.*

State and year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel Nov. 15.	Farm value Nov. 15.
	Acres.	*Bushels.*	*Bushels.*	*Cents.*	*Dollars.*
Virginia	138,000	32.0	4,416,000	136.0	6,006,000
North Carolina	113,000	35.0	3,955,000	137.0	5,418,000
South Carolina	36,000	45.0	1,620,000	212.0	3,434,000
Georgia	224,000	34.0	7,616,000	123.0	9,368,000
Florida	115,000	28.0	3,220,000	149.0	4,798,000
Missouri	400	40.0	16,000	360.0	58,000
Tennessee	7,000	40.0	280,000	155.0	434,000
Alabama	410,000	22.0	9,020,000	95.0	8,569,000
Mississippi	3,000	25.0	75,000	193.0	145,000
Louisiana	3,000	29.0	87,000	155.0	135,000
Texas	184,000	26.0	4,784,000	179.0	8,563,000
Oklahoma	13,000	35.0	455,000	204.0	928,000
Arkansas	16,000	26.0	416,000	234.0	973,000
Total	1,262,400	28.5	35,960,000	135.8	48,829,000
1919	1,256,400	27.0	33,925,000	240.9	81,742,000
1918	1,865,400	24.7	46,010,000	173.7	79,929,000
1917	1,842,400	28.5	52,505,000	174.3	91,498,000
1916	1,043,350	33.0	34,433,500	120.1	41,357,000

TABLE 194.—*Peanuts: Farm price, cents per pound on 15th of each month, 1911-1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15	9.9	6.0	7.0	4.9	4.3	4.5	4.7	4.6	4.3	4.4
Feb. 15	10.5	6.9	7.2	5.3	4.4	4.4	4.7	4.5	4.7	5.0
Mar. 15	11.2	7.0	7.4	5.5	4.4	4.2	4.7	4.7	5.0	4.8
Apr. 15	10.9	6.9	8.3	6.2	4.6	4.5	4.9	4.8	4.9	4.9
May 15	11.2	7.2	8.2	7.2	4.6	4.8	5.1	4.7	4.9	4.8
June 15	11.2	7.7	7.9	7.7	4.7	4.8	5.1	5.0	5.2	5.2
July 15	11.0	8.2	7.8	7.6	4.6	4.7	5.2	5.1	4.9	5.0
Aug. 15	8.5	8.1	7.9	7.2	4.6	4.5	4.9	4.9	5.0	5.3
Sept. 15	8.0	8.3	8.3	6.6	4.4	4.4	5.0	4.9	4.8	5.1
Oct. 15	5.8	8.1	6.9	6.1	4.4	4.3	4.5	4.8	4.7	4.6
Nov. 15	5.3	9.1	6.6	7.1	4.4	4.2	4.4	4.4	4.7	4.4
Dec. 15	4.7	9.1	6.1	7.1	4.7	4.2	4.3	4.8	4.6	4.4

TRUCK CROPS.

TABLE 195.—*Commercial acreage and production of truck crops in the United States, 1917–1920.*

Crop.	Number of States reporting.		Acreage.				Production.			
	1917–18	1919–20	1917	1918	1919	1920	1917	1918	1919	1920
			Acres.	*Acres.*	*Acres.*	*Acres.*				
Aspharagus, tons..	24	7	31,647	26,459	28,378	26,749	36,289	28,004	37,043	38,603
Beans (snap), tons.	33	30	31,104	31,618	12,394	11,456	54,156	56,859	23,676	24,683
Cabbage, tons.....	28	29	93,518	92,715	68,135	104,848	603,962	684,812	443,400	940,525
Cantaloupes,[1] crts.	16	23	60,150	39,650	65,547	68,932	8,006,500	5,796,000	11,159,426	11,652,356
Cauliflower,[2] crts..	20	5	9,086	9,972	8,170	9,045	1,898,974	2,084,148	2,123,475	2,422,005
Celery,[3] crts.......	7	8	14,500	14,750	13,107	15,170	6,597,750	6,436,500	2,676,096	3,660,773
Corn (sweet), tons.	28	26	201,645	278,480	223,408	285,554	377,688	511,809	476,489	577,464
Cucumbers, tons..	23	24	50,521	63,005	52,785	46,449	42,581	111,711	74,822	41,654
Lettuce,[4] crts......	8	8	12,500	15,350	15,600	22,357	6,348,300	7,476,900	8,116,100	12,106,055
Onions, bu.........	22	24	64,460	64,715	47,635	63,809	19,133,000	19,336,000	12,833,500	21,335,000
Peas, tons.........	32	19	180,407	127,611	115,020	139,188	152,462	132,769	96,510	133,272
Potatoes (early Irish), bu........	16	17	267,850	258,650	182,250	231,887	18,552,300	27,471,750	16,914,000	26,354,140
Strawberries,[5] crts.	26	26	109,510	83,820	63,700	67,500	7,948,141	5,152,605	4,856,900	4,590,750
Tomatoes, tons....	42	36	300,850	351,252	237,195	244,745	1,074,596	1,462,869	855,782	1,022,258
Watermelons, No.	17	18	120,700	67,745	110,691	133,250	44,964,000	27,533,000	37,585,543	49,577,354

[1] Standard crates.
[2] Crates of 1 dozen heads each.
[3] Crates of 10 bunches of 1 dozen plants each.
Crates of 2 dozen heads each.
[5] Crates containing 24 quarts.

CABBAGE.

TABLE 196.—*Cabbage: Farm price, per 100 pounds on 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15......................	$4.31	$2.19	$2.74	$3.95	$1.17	$1.36	$1.87	$1.26	$1.89	$1.56
Feb. 15......................	5.05	2.33	3.26	5.65	1.21	1.41	2.07	1.17	2.24	1.48
Mar. 15......................	5.25	2.71	2.86	6.77	1.38	1.38	2.03	1.03	2.88	1.26
Apr. 15......................	5.59	3.79	2.98	7.61	1.50	1.99	2.24	1.15	3.17	1.33
May 15......................	6.75	4.97	3.23	7.53	1.93	2.53	2.05	1.58	2.98	1.38
June 15......................	5.47	4.68	3.55	5.10	2.27	2.34	2.61	2.18	2.67	2.46
July 15......................	4.71	4.23	3.41	3.23	2.15	1.95	2.66	2.64	2.29	2.93
Aug. 15......................	3.28	3.73	2.96	2.19	2.26	1.61	1.74	2.15	1.88	2.47
Sept. 15......................	2.03	3.08	2.45	1.76	2.17	1.24	1.50	1.79	1.25	1.98
Oct. 15......................	1.95	2.88	2.16	1.79	2.40	1.00	1.31	1.69	1.08	1.51
Nov. 15......................	1.67	2.74	1.99	2.66	2.61	.97	1.14	1.58	1.04	1.54
Dec. 15......................	1.77	3.49	2.05	2.28	3.04	1.07	1.26	1.75	1.15	1.83

CABBAGE—Continued.

TABLE 197.—*Commercial acreage, yield per acre, and production of cabbages in the United States, 1915-1920.*

State.	Acreage harvested.						Yield per acre.						Production in cars—25,000 pounds.					
	1915	1916	1917	1918	1919	1920	1915	1916	1917	1918	1919	1920	1915	1916	1917	1918	1919	1920
Early:	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*
California	3,500	3,600	3,800	4,300	5,160	8,300	8.5	8.5	7.0	5.0	4.0	7.1	2,384	2,448	2,128	1,720	1,651	4,714
Florida	3,400	4,500	5,700	9,200	3,950	9,000	7.6	7.6	2.0	5.3	6.0	6.8	2,064	2,736	912	3,901	1,896	4,896
Louisiana[1]	1,500	1,500	1,600	1,200	1,980	2,178	5.0	5.0	2.0	3.0	4.0	8.2	600	640	256	288	634	1,429
Texas	4,100	4,400	8,900	6,650	4,430	16,400	3.3	3.3	2.0	0.8	5.0	4.8	1,080	1,160	1,424	425	1,772	6,298
Late:																		
Alabama	1,100	1,000	1,000	1,500	1,380	1,518	8.3	8.3	3.0	7.8	7.0	7.8	728	664	160	936	773	947
Colorado	3,700	3,200	3,300	4,220	3,420	4,100	10.8	10.3	12.9	9.0	10.0	14.0	3,197	2,637	3,406	3,038	2,736	4,592
Idaho	32	35	30	35	35	38	9.0	8.5	8.6	7.5	10.0	10.0	23	24	20	21	28	30
Illinois	325	375	235	225	170	187	8.0	7.5	7.8	8.0	5.0	8.1	208	225	147	144	68	121
Indiana	1,300	1,100	1,300	1,400	830	900	5.0	3.5	9.5	8.2	6.3	10.2	520	308	988	918	418	734
Iowa	2,800	1,700	1,000	1,800	1,170	1,085	10.0	6.5	7.2	7.0	4.5	8.0	2,240	884	576	1,008	421	694
Kentucky	300	350	250	200	200	220	9.3	9.5	8.7	9.2	8.6	6.6	223	266	174	147	136	116
Maryland	1,565	1,584	340	180	470	517	8.0	8.5	8.5	8.4	8.0	5.8	1,001	1,077	231	121	301	240
Michigan	4,600	2,400	5,100	3,750	1,440	2,090	9.0	7.1	8.3	10.2	6.8	13.5	3,312	1,363	3,386	3,101	783	2,257
Minnesota	2,300	1,500	2,500	1,650	1,740	2,355	9.0	6.4	9.5	9.3	8.0	7.3	1,656	768	1,900	1,227	1,113	1,375
Mississippi	1,200	1,200	2,100	2,600	1,450	1,595	4.3	4.3	3.0	5.7	5.5	8.4	416	416	504	1,186	638	1,072
Missouri	135	115	125	105	250	275	7.3	8.3	7.5	9.4	8.0	8.0	79	76	75	79	160	176
Nebraska	65	55	25	25	25	28	7.3	8.3	7.0	9.2	9.0	9.0	38	36	14	18	18	20
New Jersey	1,650	1,695	1,620	1,500	1,390	1,529	8.0	9.2	8.6	8.7	7.5	8.1	1,056	1,248	1,115	1,044	831	991
New York	35,900	17,800	28,300	28,000	20,120	26,652	10.0	5.4	7.3	9.1	6.5	12.0	28,720	7,690	16,527	20,384	10,462	25,586
North Carolina	500	550	350	400	280	908	9.0	9.0	4.5	5.0	3.5	7.5	260	396	126	160	78	545
Ohio	3,900	2,200	3,500	3,080	2,030	2,670	7.0	5.3	8.3	7.0	7.0	10.2	2,184	933	2,321	1,736	1,137	2,179
Oregon	175	200	195	275	275	302	9.0	9.5	8.0	7.0	11.0	8.0	126	152	125	154	242	193
Pennsylvania	650	555	350	275	320	352	10.0	5.0	7.0	9.0	8.0	9.0	520	222	196	198	205	253
South Carolina	2,300	2,300	3,100	3,500	2,060	2,266	9.0	9.0	3.0	8.0	7.5	7.4	1,656	1,656	744	2,240	1,236	1,341
Tennessee	250	275	300	310	420	462	8.6	8.2	8.0	8.8	6.0	8.5	172	180	192	218	201	314
Utah	18	20	23	25	25	28	8.5	8.2	8.5	7.5	10.0	10.0	12	13	16	15	20	22
Virginia—																		
Eastern shore and Norfolk section	4,750	5,050	4,350	3,050	2,475	2,722	9.2	9.2	4.6	7.3	6.5	7.2	3,504	3,714	1,620	1,780	1,287	1,568
Southwestern	1,400	1,700	2,150	1,500	1,520	2,085	9.0	7.1	6.8	8.9	7.5	12.4	1,008	966	1,170	1,068	912	2,068
Washington	165	185	175	260	260	286	9.2	8.6	8.6	7.2	10.0	8.9	121	127	120	150	208	201
Wisconsin	13,500	9,200	11,800	11,500	8,660	13,800	9.9	6.3	8.2	8.0	7.2	9.3	10,692	4,637	7,741	7,360	5,104	10,267

[1] New Orleans section.

ONIONS.

TABLE 198.—*Commercial acreage, yield per acre, and production of onions in the United States, 1915–1920.*

State.	Acreage harvested.						Yield per acre.						Production (cars of 500 bushels each).					
	1915	1916	1917	1918	1919	1920	1915	1916	1917	1918	1919	1920	1915	1916	1917	1918	1919	1920
Early crop:	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*	*Cars.*
California	650	900	1,250	1,400	870	3,300	325	320	340	330	311	265	422	576	850	932	541	1,749
Louisiana	2,000	3,000	3,000	1,500	350	3,000	175	165	185	190	160	200	700	990	1,110	570	112	1,200
Texas	8,943	10,057	12,050	18,070	6,630	12,402	237	225	265	144	210	221	4,238	4,525	6,386	5,204	3,182	5,556
Late crop:																		
California	5,100	5,300	8,600	8,200	[1] 7,570	8,400	375	348	394	350	325	250	3,826	3,689	6,777	5,740	4,920	4,200
Colorado	388	400	850	1,350	550	650	391	270	266	244	250	358	304	200	452	657	271	465
Idaho	175	200	450	30	75	240	400	500	400	575	500	600	140	216	360	34	75	288
Illinois	900	850	1,000	1,100	830	900	215	225	275	345	200	430	386	383	550	758	332	774
Indiana	3,070	3,600	4,250	2,950	3,450	4,509	184	206	293	362	200	542	1,129	1,483	2,490	2,136	1,380	4,888
Iowa	527	565	1,100	1,100	950	1,382	400	287	315	365	300	304	421	324	693	781	570	840
Kentucky	950	1,100	1,000	850	1,200	1,200	227	232	225	301	300	368	431	510	450	511	720	883
Massachusetts	3,923	3,800	4,150	4,600	4,250	4,010	346	340	344	475	340	498	2,714	2,584	2,855	4,369	2,890	3,994
Michigan	933	750	1,500	1,200	1,100	1,235	240	266	304	414	175	468	448	398	912	993	385	1,156
Minnesota	1,027	1,000	1,450	1,350	1,250	1,326	375	206	388	416	275	317	770	412	1,126	1,123	675	841
Nevada	25	55	15	25	25	25	225	184	245	265	350	350	11	20	7	13	17	18
New Jersey	2,185	2,900	2,450	2,000	2,000	2,840	320	275	348	320	250	250	1,398	1,595	1,705	1,280	1,000	1,420
New York	12,551	6,600	9,800	8,650	7,280	7,952	287	195	278	408	265	371	7,205	2,574	5,448	7,058	3,858	5,900
Ohio	2,667	5,200	6,600	6,060	5,300	6,148	102	277	258	312	250	428	544	2,881	3,403	3,781	2,650	5,263
Oregon	691	750	1,050	750	800	750	400	500	256	235	300	366	553	750	537	352	480	549
Pennsylvania	404	250	350	200	120	140	250	300	269	283	300	425	202	150	188	114	72	119
Texas	....	....	875	950	1,100	1,100	....	....	200	250	250	250	....	....	349	475	550	550
Utah	75	90	100	100	65	130	400	400	400	510	500	480	60	72	80	102	65	125
Virginia (eastern shore)	1,169	375	426	380	300	300	200	200	214	265	250	316	468	154	182	202	150	190
Washington	781	800	1,200	1,000	640	810	400	492	313	400	400	412	624	787	751	800	512	667
Wisconsin	817	950	950	900	930	1,060	350	228	318	382	140	488	572	433	605	687	260	1,035

[1] Does not include acreage grown under contract with seedsmen.

TABLE 199.—*Onions: Farm price, cents per bushel on 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Jan. 15	280.8	133.5	178.9	208.4	113.2	88.9	121.0	81.6	117.0	101.0	July 15	204.8	232.0	162.6	201.0	147.3	93.0	170.4	101.7	114.0	122.0
Feb. 15	307.3	154.7	183.2	357.9	126.3	97.6	140.7	77.5	140.0	104.0	Aug. 15	176.4	225.8	164.7	154.7	133.5	86.3	137.9	105.1	100.0	116.0
Mar. 15	325.6	199.8	147.0	476.2	130.3	95.3	155.2	77.0	167.0	105.0	Sept. 15	172.9	195.4	163.3	142.9	122.9	82.8	103.3	103.9	89.0	104.0
Apr. 15	344.2	202.1	134.1	495.6	123.5	104.4	159.2	79.0	175.0	119.0	Oct. 15	158.9	196.4	143.2	157.5	131.4	94.8	88.3	110.2	85.0	102.0
May 15	337.6	229.9	134.7	398.0	123.3	102.9	152.6	87.2	177.0	129.0	Nov. 15	143.8	212.5	143.1	176.6	153.8	94.8	84.4	114.9	84.0	103.0
June 15	264.2	234.1	138.7	308.0	133.8	102.9	140.8	95.6	155.0	134.0	Dec. 15	132.0	245.8	131.7	177.0	175.7	99.6	92.3	114.9	84.0	113.0

TOMATOES.

TABLE 200.—*Commercial acreage, yield per acre, and production of tomatoes for manufacture and table stock, 1917–1920.*

States.	Acreage harvested.						
	1917		1918		1919		1920
	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table and manufacture stock.
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Alabama	0	25	0	25	0	15	53
Arkansas	0	1,824	0	7,138	0	3,841	4,163
California	2,319	23,735	2,200	41,243	2,200	29,458	31,601
Colorado	0	1,294	0	1,656	0	1,470	2,509
Connecticut	0	118	0	194	0	178	....
Delaware	0	22,483	0	15,782	0	5,535	6,267
Florida	25,830	20	15,600	625	20,900	....	22,600
Georgia	0	0	0	10	0	44	....
Idaho	0	70	0	31	0	61	....
Illinois	0	4,009	0	4,724	0	3,243	4,500
Indiana	0	32,161	0	52,137	0	33,569	33,157
Iowa	0	1,883	0	2,600	0	2,060	2,000
Kansas	0	5	0	130	0	....	....
Kentucky	0	2,540	0	9,133	0	1,990	3,944
Louisiana	0	105	0	446	0	17	....
Maryland	0	64,444	0	63,735	0	33,243	32,290
Massachusetts	0	8	0	10	0	10	....
Michigan	0	3,329	0	4,504	0	2,146	2,087
Minnesota	0	37	0	....	0	....	....
Mississippi	7,130	0	4,700	....	4,600	....	5,060
Missouri	0	10,943	0	16,428	0	12,567	15,121
Nebraska	0	58	0	70	0	85	....
New Hampshire	0	10	0	....	0	....	....
New Jersey	11,230	24,943	4,650	23,868	4,950	20,798	19,134
New Mexico	0	300	0	1,062	0	440	....
New York	0	8,584	0	10,916	0	7,802	9,837
North Carolina	0	118	0	177	0	165	....
Ohio	0	9,673	0	11,486	0	6,748	5,803
Oklahoma	0	100	0	130	0	40	....
Oregon	0	125	0	264	0	228	....
Pennsylvania	0	3,972	0	2,392	0	1,701	1,656
South Carolina	0	102	0	12	0	2	....
South Dakota	0	30	0	31	0	....	....
Tennessee	1,000	3,454	3,000	7,418	3,000	4,167	4,992
Texas	5,480	40	4,000	120	5,900	....	8,850
Utah	0	3,191	0	5,425	0	3,897	5,301
Virginia	0	22,354	0	31,381	0	18,889	18,298
Washington	0	5	0	133	0	23	....
West Virginia	0	1,481	0	1,342	0	922	1,410
Wisconsin	0	288	0	324	0	291	....
All other	....	....	....	....	....	....	4,121
Total	52,989	247,861	34,150	317,102	41,550	195,645	244,745

TOMATOES—Continued.

TABLE 200.—*Commercial acreage, yield per acre, and production of tomatoes for manufacture and table stock, 1917–1920*—Continued.

States.	Yield per acre.						
	1917		1918		1919		1920
	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table and manufacture stock.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
Alabama	....	3.0	....	3.0	....	3.0	3.0
Arkansas	....	3.3	....	2.3	....	2.8	3.6
California	7.5	7.5	5.4	5.4	7.9	6.0	7.2
Colorado	....	11.8	....	7.6	....	9.1	7.4
Connecticut	....	3.0	....	4.7	....	5.0	....
Delaware	....	3.2	....	3.8	....	1.6	4.3
Florida	2.9	3.0	3.0	2.0	2.8	....	2.9
Georgia	....	....	....	2.0	....	3.0	....
Idaho	....	6.0	....	4.0	....	6.0	....
Illinois	....	3.3	....	3.2	....	3.6	3.4
Indiana	....	2.6	....	3.7	....	4.2	3.4
Iowa	....	2.5	....	1.9	....	4.8	3.1
Kansas	....	3.0	....	2.6	....	....	....
Kentucky	....	2.7	....	1.1	....	5.5	4.0
Louisiana	....	5.0	....	3.0	....	3.0	....
Maryland	....	3.0	....	4.6	....	1.5	3.6
Massachusetts	....	3.0	....	4.0	....	5.0	....
Michigan	....	1.3	....	4.6	....	4.1	3.5
Minnesota	....	2.2	....	....	....	....	....
Mississippi	2.2	....	4.5	....	4.0	....	3.7
Missouri	....	3.5	....	2.2	....	2.9	3.1
Nebraska	....	3.3	....	2.6	....	1.5	....
New Hampshire	....	3.0	....	....	....	....	....
New Jersey	4.3	4.3	7.2	5.1	2.6	2.6	4.6
New Mexico	....	5.0	....	2.0	....	3.7	....
New York	....	2.5	....	5.6	....	6.5	4.9
North Carolina	....	3.0	....	1.9	....	6.0	....
Ohio	....	2.1	....	3.6	....	5.7	3.4
Oklahoma	....	3.0	....	2.6	....	4.0	....
Oregon	....	8.0	....	7.7	....	3.2	....
Pennsylvania	....	2.4	....	1.8	....	3.6	3.0
South Carolina	....	3.0	....	2.0	....	3.0	....
South Dakota	....	3.0	....	2.0	....	....	....
Tennessee	3.0	3.0	3.5	3.5	2.0	3.3	3.6
Texas	2.6	3.0	4.0	3.0	3.0	....	3.8
Utah	....	9.0	....	11.2	....	8.5	7.4
Virginia	....	3.3	....	3.5	....	2.7	3.1
Washington	....	8.0	....	4.4	....	7.0	....
West Virginia	....	1.8	....	2.1	....	4.1	2.9
Wisconsin	....	3.8	....	0.9	....	5.2	....
All other	....	....	....	....	....	....	4.1
Total	3.2	3.6	4.1	4.2	3.1	3.7	4.2

TOMATOES—Continued.

TABLE 200.—*Commercial acreage, yield per acre, and production of tomatoes for manufacture and table stock, 1917–1920*—Continued.

States.	Production.						
	1917		1918		1919		1920
	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table stock.	Manufacture stock.	Table and manufacture stock.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
Alabama	0	75	0	75	0	45	159
Arkansas	0	6,019	0	16,417	0	10,755	14,987
California	17,390	178,012	11,880	222,712	17,380	176,748	227,527
Colorado	0	15,269	0	12,586	0	13,377	18,500
Connecticut	0	354	0	912	0	890	....
Delaware	0	71,946	0	59,972	0	8,856	26,948
Florida	77,480	60	46,800	1,250	58,520	....	65,540
Georgia	0	....	0	20	0	132	....
Idaho	0	420	0	124	0	366	....
Illinois	0	13,230	0	15,117	0	11,675	15,300
Indiana	0	83,619	0	192,907	0	140,990	112,734
Iowa	0	4,708	0	4,940	0	9,888	6,200
Kansas	0	15	0	338	0	....	....
Kentucky	0	6,858	0	10,046	0	10,945	15,776
Louisiana	0	525	0	1,338	0	51	....
Maryland	0	193,332	0	293,181	0	49,864	116,244
Massachusetts	0	24	0	40	0	50	....
Michigan	0	4,328	0	20,718	0	8,799	7,304
Minnesota	0	81	0	....	0	....	....
Mississippi	15,680	0	21,150	0	18,400	0	18,722
Missouri	0	38,300	0	36,142	0	25,134	46,875
Nebraska	0	191	0	182	0	128	....
New Hampshire	0	30	0	....	0	....	....
New Jersey	48,320	107,255	33,480	121,727	12,870	54,075	88,016
New Mexico	0	1,500	0	2,124	0	1,628	....
New York	0	21,460	0	61,130	0	50,713	48,201
North Carolina	0	354	0	336	0	990	....
Ohio	0	20,313	0	41,350	0	38,464	19,730
Oklahoma	0	300	0	338	0	160	....
Oregon	0	1,000	0	2,033	0	730	....
Pennsylvania	0	9,533	0	4,306	0	6,124	4,958
South Carolina	0	306	0	24	0	6	....
South Dakota	0	90	0	62	0	....	....
Tennessee	3,020	10,362	10,500	25,963	6,000	13,751	17,971
Texas	16,430	120	16,000	360	17,700	....	33,630
Utah	0	28,719	0	60,760	0	33,124	39,227
Virginia	0	73,768	0	109,834	0	51,000	56,724
Washington	0	40	0	585	0	161	....
West Virginia	0	2,666	0	2,818	0	3,780	4,089
Wisconsin	0	1,094	0	292	0	1,513	....
All other	0	....	0	....	0	....	16,896
Total	178,320	896,276	139,810	1,323,059	130,870	724,912	1,022,258

TABLE 201.—*Tomatoes: Farm price, cents per bushel, 15th of month, 1912–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912
July 15	324.4	240.3	219.1	194.3	161.5	141.4	167.4	161.4	127.0
Aug. 15	168.4	177.0	133.1	124.3	88.4	66.4	92.5	95.8	75.6
Sept. 15	104.4	137.2	103.0	109.5	75.6	56.9	63.0	68.0	58.7
Oct. 15	98.9	117.7	108.6	117.6	82.1	67.9	60.3	73.0	62.3

TURNIPS.

TABLE 202.—*Turnips: Farm price, cents per bushel, 15th of month, 1912–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912
Jan. 15	112.4	82.1	88.4	78.6	48.6	42.9	56.8	49.6	....
Feb. 15	124.1	84.7	89.9	91.1	49.6	51.1	60.0	51.2	....
Nov. 15	94.1	98.9	79.6	76.4	68.4	45.9	47.4	56.1	44.6
Dec. 15	85.9	101.8	79.0	81.1	73.3	45.1	48.4	55.1	49.1

SUGAR.

TABLE 203.—*Sugar: Production in the United States and its possessions, 1856–57 to 1920–21.*[1]

[Data for 1912–13 and subsequently beet sugar, also Louisiana and Hawaii cane sugar, estimated by United States Department of Agriculture; Porto Rico, by Treasury Department of Porto Rico; Philippine Islands, production estimated by the Philippine Department of Agriculture and exports for years ending June 30. For sources of data for earlier years, see Yearbook for 1912, p. 650. A short ton is 2,000 pounds.]

Year.	Beet sugar (chiefly refined).	Cane sugar (chiefly raw).					Total.
		Louisiana.	Other States.[2]	Porto Rico.	Hawaii.	Philippine Islands.[3]	
Average:	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*
1856–57 to 1860–61	....	132,402	5,978	75,364	....	46,446	260,190
1861–62 to 1865–66	269	74,036	1,945	71,765	....	54,488	202,503
1866–67 to 1870–71	448	44,768	3,818	96,114	....	81,485	226,633
1871–72 to 1875–76	403	67,341	4,113	87,606	(4)	119,557	279,020
1876–77 to 1880–81	470	104,920	5,327	76,579	27,040	169,067	383,403
1881–82 to 1885–86	692	124,868	7,280	87,441	76,075	189,277	485,633
1886–87 to 1890–91	1,922	163,049	8,439	70,112	125,440	186,129	555,091
1891–92 to 1895–96	19,406	268,655	6,634	63,280	162,538	286,629	807,142
1896–97 to 1900–1901	58,287	282,399	4,405	61,292	282,585	134,722	823,690
1901–2 to 1905–6	239,730	352,053	12,126	141,478	403,308	108,978	1,257,673
1906–7 to 1910–11	479,153	348,544	13,664	282,136	516,041	145,832	1,785,370
1901–2	184,606	360,277	4,048	103,152	355,611	75,011	1,082,705
1902–3	218,406	368,734	4,169	100,576	437,991	123,108	1,252,984
1903–4	240,604	255,894	22,176	138,096	367,475	82,855	1,107,100
1904–5	242,113	398,195	16,800	151,088	426,248	125,271	1,359,715
1905–6	312,921	377,162	13,440	214,480	429,213	138,645	1,485,861
1906–7	483,612	257,600	14,560	206,864	440,017	132,602	1,535,255
1907–8	463,628	380,800	13,440	230,095	521,123	167,242	1,776,328
1908–9	425,884	397,600	16,800	277,093	535,156	123,876	1,776,409
1909–10	512,469	364,000	11,200	346,786	517,090	140,783	1,892,328
1910–11	510,172	342,720	12,320	349,840	566,821	164,658	1,946,531
1911–12	599,500	352,874	8,000	371,076	595,038	205,046	2,131,534
1912–13	692,556	153,573	9,000	398,004	546,524	[5] 345,077	2,144,734
1913–14	733,401	292,698	7,800	351,666	612,000	408,339	2,405,904
1914–15	722,054	242,700	3,920	346,490	646,000	421,192	2,382,356
1915–16	874,220	137,500	1,120	483,590	592,763	412,274	2,501,467
1916–17	820,657	303,900	7,000	503,081	644,663	425,266	2,701,567
1917–18	765,207	243,600	2,240	453,796	576,700	474,745	2,516,288
1918–19	760,950	280,900	3,500	406,003	600,312	453,346	2,505,011
1919–20	726,451	121,000	1,125	485,884	556,343	466,854	2,357,657
1920–21[6]	1,109,600	186,000	7,000	....	....	....	....

[1] Census returns give production of beet sugar for 1899 as 81,729 short tons; for 1904, 253,921; 1909, 501,682; production of cane sugar in Louisiana for 1839, 59,974 short tons; 1849, 226,001 hogsheads; 1859, 221,726 hogsheads; 1869, 80,706 hogsheads; 1879, 171,706 hogsheads; 1889, 146,062 short tons; 1898, 278,497 short tons; 1899, 159,583; and 1909, 325,516 short tons; cane sugar in other States, 1839, 491 short tons; in 1849, 21,576 hogsheads; in 1859, 9,256 hogsheads; in 1869, 6,337 hogsheads; in 1879, 7,166 hogsheads; in 1889, 4.580 short tons; in 1899, 1,691; and in 1909, 8,687 short tons.

[2] Includes Texas only, subsequent to 1902–3. Unofficial returns prior to 1918–19.

[3] Exports for years ending June 30.

[4] Complete data not available for this period. Production in 1878–79, 1,254 short tons; in 1879–80, 1,304 short tons.

[5] Production subsequent to 1911–12.

[6] Subject to revision.

SUGAR—Continued.

TABLE 204.—*Sugar beets and beet sugar: Production in the United States, 1913–1920*

[Figures for 1920 are subject to revision.]

State and year.[1]	Area of beets.			Beets produced (weight as delivered to factories).			
	Planted.	Harvested.		Quantity.	Yield per acre.	Farm value.	Price to growers per ton.
		Amount.	Per cent of planted.				
	Acres.	*Acres.*	*Per cent.*	*Short tons.*	*Short tons.*	*Dollars.*	*Dollars.*
California:							
1920	135,700	123,500	89.82	1,037,000	8.40	14,120,000	13.62
1919	129,500	107,174	82.76	815,896	7.61	11,561,000	14.17
1918	120,900	100,684	83.28	858,028	8.52	8,534,000	9.95
1917	190,200	161,909	85.13	1,331,548	8.22	10,125,000	7.60
Colorado:							
1920	253,600	221,500	87.34	2,370,000	10.70	28,154,000	11.88
1919	236,300	182,616	77.28	1,764,772	9.66	19,143,000	10.85
1918	142,000	125,882	88.65	1,443,846	11.47	14,474,000	10.02
1917	183,600	161,476	87.95	1,857,649	11.50	13,526,000	7.28
Idaho:							
1920	57,600	55,600	96.53	498,000	8.96	6,022,000	12.09
1919	53,700	30,331	56.48	203,168	6.70	2,235,000	11.00
1918	37,700	32,306	85.69	344,334	10.66	3,443,000	10.00
1917	46,500	37,745	81.17	312,067	8.27	2,203,000	7.06
Michigan:							
1920	169,400	145,200	85.71	125,900	8.67	12,574,000	9.99
1919	166,100	123,375	74.28	1,211,018	9.82	15,158,000	12.52
1918	134,500	114,976	85.48	966,676	8.40	9,741,000	10.08
1917	112,700	82,151	72.89	524,195	6.38	4,215,000	8.04
Nebraska:							
1920	78,900	72,000	91.25	707,000	9.82	8,445,000	11.94
1919	64,800	59,113	91.22	600,730	10.16	6,546,000	10.90
1918	44,600	42,746	95.84	485,070	11.35	4,833,000	9.96
1917	55,500	51,337	92.50	473,494	9.22	3,417,000	7.22
Ohio:							
1920	48,300	46,800	96.89	451,000	9.64	4,160,000	9.22
1919	37,100	30,909	83.29	326,962	10.58	4,168,000	12.75
1918	36,100	32,547	90.16	315,371	9.69	3,162,000	10.03
1917	29,300	24,234	82.71	219,931	9.08	1,580,000	7.18
Utah:							
1920	116,100	112,700	97.05	1,304,000	11.57	15,674,000	11.66
1919	109,700	103,247	94.12	1,015,873	9.84	11,148,000	10.97
1918	90,100	81,717	90.70	1,003,013	12.27	10,041,000	10.01
1917	91,100	80,289	88.13	762,028	7.49	5,368,000	7.04
Wisconsin:							
1920	29,000	23,200	80.00	201,000	8.66	2,104,000	10.47
1919	16,200	12,100	74.69	117,443	9.71	1,411,000	12.02
1918	14,900	12,400	83.22	99,777	8.05	998,000	10.00
1917	14,100	9,800	69.50	79,372	8.10	699,000	8.81
Other States:							
1920	89,900	81,500	90.66	718,000	8.81	8,143,000	11.34
1919	77,000	43,590	56.61	365,616	8.39	4,050,000	11.08
1918	68,900	50,752	73.66	432,683	8.53	4,268,000	9.86
1917	83,600	55,856	66.81	420,093	7.52	3,059,000	7.28
United States:							
1920	978,500	882,000	90.14	8,545,000	9.69	99,396,000	11.63
1919	890,400	692,455	77.77	6,421,478	9.27	75,420,000	11.74
1918	689,700	594,010	86.13	5,948,798	10.01	59,494,000	10.00
1917	806,600	664,797	82.43	5,980,377	9.00	44,192,000	7.39
1916	768,500	665,308	86.57	6,228,256	9.36	38,139,000	6.12
1915	664,300	611,301	92.02	6,511,274	10.7	36,950,000	5.67
1914	514,600	483,400	93.94	5,585,000	11.6	30,438,000	5.45
1913	635,100	580,006	91.33	5,886,000	10.1	33,491,000	5.69

[1] In this table the acreage and production of beets are credited to the respective States in which the beets were made into sugar and not to the States in which the beets were actually produced.

SUGAR—Continued.

TABLE 204.—*Sugar beets and beet sugar: Production in the United States, 1913–1920*—Con.

[Figures for 1920 are subject to revision.]

State and year.[1]	Factories operating.	Average length of campaign.	Sugar made (chiefly refined).	Sugar beets used.			Analysis of beets.		Recovery of sucrose.[4]		
				Area harvested.	Average yield per acre.	Quantity worked (sliced).	Percentage of sucrose.[2]	Purity coefficient.[3]	Percentage of weight of beets.	Percentage of total sucrose in beets.	Loss.[5]
	No.	*Days.*	*Short tons.*	*Acres.*	*Short tons.*	*Short tons.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
California:											
1920	11	......	163,700	123,500	......	1,037,000	17.90	......	15.79	88.21	2.11
1919	10	76	131,172	107,174	7.51	804,642	17.87	82.02	16.30	91.21	1.57
1918	13	81	122,795	100,684	8.40	845,728	17.03	81.50	14.52	85.26	2.51
1917	14	92	209,325	161,909	8.16	1,321,716	18.48	82.91	15.84	85.71	2.64
1916	11	108	236,322	141,097	10.37	1,462,895	18.35	84.13	16.15	88.01	2.20
Colorado:											
1920	17	......	302,700	221,500	......	2,370,000	15.83	......	12.77	80.67	3.06
1919	15	87	193,890	182,616	9.07	1,656,113	13.62	83.85	11.71	85.98	1.91
1918	14	76	191,880	125,882	10.83	1,363,277	16.10	85.96	14.07	87.39	2.03
1917	15	91	234,303	161,476	10.84	1,749,875	15.40	85.16	13.39	86.95	2.01
1916	14	102	252,147	188,568	10.25	1,933,591	15.00	85.79	13.04	86.93	1.96
Idaho:											
1920	9	......	64,600	55,600	......	498,000	16.08	......	12.97	80.65	3.11
1919	6	50	26,159	30,331	6.49	196,847	15.48	86.15	13.29	85.85	2.19
1918	7	87	44,682	32,306	10.12	326,979	16.57	86.46	13.66	82.44	2.91
1917	7	70	38,376	37,745	7.59	286,446	16.74	84.84	13.40	80.05	3.34
1916	5	86	45,874	42,135	7.87	331,478	16.95	86.39	13.84	81.65	3.11
Michigan:											
1920	17	......	167,500	145,200	......	1,259,000	16.21	......	13.30	82.05	2.91
1919	16	84	130,385	123,375	8.36	1,032,018	14.57	81.78	12.63	86.68	1.94
1918	16	75	127,979	114,976	7.74	890,238	16.61	85.49	14.38	86.51	2.23
1917	14	53	64,247	82,151	5.62	461,721	16.28	86.57	13.91	85.44	2.37
1916	15	49	69,341	99,619	5.05	502,705	16.37	85.22	13.79	84.24	2.58
Nebraska:											
1920	5	......	87,500	72,000	......	707,000	15.70	......	12.38	78.86	3.32
1919	4	112	60,870	59,113	9.37	554,100	13.14	82.80	10.99	83.64	2.15
1918	4	99	63,494	42,746	10.60	453,266	16.05	86.14	14.01	87.29	2.04
1917	4	97	53,893	51,337	9.22	443,355	14.91	80.71	12.16	81.56	2.75
1916	3	107	51,945	41,083	10.34	404,017	15.51	81.12	12.86	82.91	2.65
Ohio:											
1920	5	......	55,700	46,800	......	451,000	15.66	......	12.35	78.86	3.31
1919	5	79	31,864	30,909	9.43	291,583	14.15	82.73	10.93	77.24	3.22
1918	5	91	35,476	32,547	8.94	291,064	15.74	84.23	12.19	77.45	3.55
1917	5	70	24,467	24,234	8.36	202,624	16.24	86.25	12.08	74.38	4.16
1916	4	45	18,234	24,767	5.56	137,696	15.89	83.36	13.24	83.32	2.65
Utah:											
1920	18	......	153,200	112,700	......	1,304,000	15.41	......	11.40	73.98	4.01
1919	18	84	101,025	103,247	8.80	908,122	13.87	82.39	11.12	80.17	2.75
1918	16	98	105,794	81,717	11.08	905,064	15.29	84.21	11.69	76.46	3.60
1917	15	82	83,662	80,289	8.68	696,522	15.61	82.27	12.01	76.94	3.60
1916	11	95	90,277	68,211	10.38	708,237	16.05	84.79	12.75	79.44	3.30
Wisconsin:											
1920	5	......	25,100	23,200	......	201,000	15.92	......	12.49	78.45	3.43
1919	4	60	10,636	12,100	8.73	105,578	13.16	81.73	10.07	76.52	3.09
1918	4	61	13,358	12,400	7.54	93,467	16.29	82.40	14.29	87.72	2.00
1917	4	53	8,032	9,800	7.23	70,830	15.03	......	11.34	75.45	3.69
1916	3	48	6,800	7,000	8.39	58,700	14.90	......	11.58	77.72	3.32
Other States:											
1920	12	......	89,600	81,500	......	718,000	15.72	......	12.48	79.39	3.24
1919[6]	11	52	40,450	43,590	7.77	338,554	14.27	83.14	11.95	83.74	2.32
1918	10	64	55,492	50,752	8.05	408,423	15.95	84.31	13.59	85.20	2.36
1917	13	51	48,902	55,856	7.03	392,456	15.17	81.87	12.46	82.14	2.71
1916	8	57	49.717	52,828	7.20	380,354	15.69	82.67	13.07	83.30	2.62
United States:											
1920	99	......	1,109,600	882,000	......	8,545,000	16.06	......	12.99	80.88	3.07
1919	89	78	726,451	692,455	8.50	5,887,557	14.48	82.84	12.34	85.22	2.14
1918	89	81	760,950	594,010	9.39	5,577,506	16.18	84.70	13.64	84.30	2.54
1917	91	74	765,207	664,797	8.46	5,625,545	16.28	83.89	13.60	83.54	2.68
1916	74	80	820,657	665,308	8.90	5,919,673	16.30	84.74	13.86	85.03	2.44
1915	67	92	874,220	611,301	10.10	6,150,293	16.49	84.38	14.21	86.17	2.28
1914	60	85	722,054	483,400	10.9	5,288,500	16.38	83.89	13.65	83.33	2.73
1913	71	85	733,401	580,006	8.76	5,659,462	15.78	83.22	12.96	82.13	2.82

[1] Acreage and production of beets are credited, as in former reports, to the State in which the beets were made into sugar.

[2] Based upon weight of beets.

[3] Percentage of sucrose (pure sugar) in the total soluble solids of the beets.

[4] Percentage of sucrose actually extracted by factories.

[5] Percentage of sucrose (based upon weight of beets) remaining in molasses and pulp.

[6] Includes 2 factories in Washington, 3 in Wyoming, and 1 each in Illinois, Indiana, Iowa, Kansas, Minnesota, and Montana.

SUGAR—Continued.

TABLE 205.—*Cane-sugar production of Louisiana, 1911–1920.*

[Figures for 1920 are from returns made before the end of the season, and are subject to revision.]

Year of cane harvest.	Factories in operation.	Sugar made.	Average sugar made, per ton of cane.	Cane used for sugar.			Molasses made.[1]	
				Area.	Average per acre.	Production.	Total.	Per ton of sugar.
	Number.	*Short tons.*	*Pounds.*	*Acres.*	*Short tons.*	*Short tons.*	*Gallons.*	*Gallons.*
1911	188	352,874	120	310,000	19	5,887,292	35,062,525	99
1912	126	153,573	142	197,000	11	2,162,574	14,302,169	93
1913	153	292,698	139	248,000	17	4,214,000	24,046,320	82
1914	149	242,700	152	213,000	15	3,199,000	17,177,443	71
1915	136	137,500	135	183,000	11	2,018,000	12,743,000	93
1916	150	303,900	149	221,000	18	4,072,000	26,154,000	86
1917	140	243,600	128	244,000	15.6	3,813,000	30,728,000	126
1918	134	280,900	135	231,200	18	4,170,000	28,049,000	100
1919	121	121,000	129	179,900	10.5	1,883,000	12,991,000	107
1920	....	186,000	127	196,000	15	2,935,000	18,624,000	100

[1] Figures for molasses, 1911-1914, are as reported by the Louisiana Sugar Planters' Association: figures for later years as reported by Bureau of Crop Estimates, U. S. Department of Agriculture.

TABLE 206.—*Area of sugar cane and production of cane sirup in the United States, 1919 and 1920.*

[Not including sorghum.]

State.	Total cane area.		Area harvested for sirup.		Sirup made.	
	1920	1919	1920	1919	1920	1919
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Gallons.*	*Gallons.*
South Carolina	9,300	7,700	8,900	7,400	979,000	1,369,000
Georgia	72,000	67,600	60,000	56,000	9,697,000	10,640,000
Florida	28,000	21,000	24,000	17,000	6,110,000	4,590,000
Alabama	73,000	62,500	60,000	51,000	10,298,000	8,480,000
Mississippi	35,000	31,400	29,000	26,700	7,497,000	6,675,000
Louisiana	299,000	275,000	23,000	20,800	6,274,000	3,672,000
Texas	16,400	12,600	7,100	7,800	2,215,000	2,421,000
Arkansas	2,900	3,200	2,500	2,200	437,000	336,000
Total	535,600	481,000	214,500	188,900	43,507,000	38,183,000

TABLE 207.—*Total and per capita sugar supply of the United States, 1901–1920.*

[The "supply" shown below consists of domestic production, plus imports, minus exports, and is quoted from the Statistical Abstract of the United States for 1918, pp. 560-561, for all years except 1919. Figures for 1919 are based upon the Bureau of Crop Estimates reports on production and the Bureau of Foreign and Domestic Commerce reports on exports and imports. The average per capita supply is computed from the Census estimates of population for June 1, each year. No allowance has been made for sugar carried over from one fiscal year to the next.]

Year ending June 30—	Supply ("consumption") of sugar.		Year ending June 30—	Supply ("consumption") of sugar.	
	Total.	Per capita.		Total.	Per capita.
	Millions of pounds.	*Pounds.*		*Millions of pounds.*	*Pounds.*
1901	5,585	71.96	1911	7,236	77.34
1902	5,019	63.35	1912	7,862	82.78
1903	6,380	78.92	1913	8,324	85.43
1904	5,662	68.66	1914	8,794	89.91
1905	6,026	71.66	1915	8,627	86.94
Ave., 1901-1905	5,734	70.91	Ave., 1911-1915	8,169	84.48
1906	6,491	75.74	1916	7,960	79.10
1907	7,090	81.19	1917	8,468	82.97
1908	6,591	74.11	1918	8,090	78.20
1909	7,283	80.43	1919	8,727	83.72
1910	7,360	79.87	1920 [1]	9,727	91.51
Ave., 1906-1910	6,963	78.27	Ave., 1916-1920	8,594	83.10

[1] Preliminary.

SUGAR—Continued.

TABLE 208.—*Cane-sugar production of Hawaii, 1913–1920.*

[Figures for 1920 are subject to revision.]

Island, and year ending Sept. 30.	Average length of campaign.	Sugar made.	Cane used for sugar.			Total area in cane.	Average extraction of sugar.	
			Area harvested.	Average yield per acre.	Production.		Per cent of cane.	Per short ton of cane.
	Days.	*Short tons.*	*Acres.*	*Short tons.*	*Short tons.*	*Acres.*	*Per cent.*	*Pounds.*
Hawaii:								
1920	168	186,062	50,800	31	1,595,000	115,400	11.67	233
1919	180	203,294	53,500	32	1,731,000	106,300	11.74	235
1918	171	162,900	52,700	28	1,498,000	130,800	10.87	217
1917	184	232,140	52,700	36	1,898,000	100,300	12.23	245
1916	179	197,130	52,627	33	1,713,759	98,787	11.50	230
1915	196	240,300	50,800	41	2,099,000	100,200	11.45	229
1914	174	213,000	51,000	36	1,854,000	....	11.49	230
1913	170	197,212	53,600	32	1,703,000	....	11.58	232
Kauai:								
1920	201	104,938	21,900	41	897,000	42,800	11.70	234
1919	161	108,943	22,300	40	898,000	47,700	12.13	243
1918	162	137,800	21,400	48	1,037,000	48,600	13.29	265
1917	207	119,218	25,400	41	1,040,000	51,300	11.46	229
1916	191	108,632	21,392	43	927,970	51,712	11.71	234
1915	203	115,700	21,000	45	941,000	49,200	12.30	246
1914	214	121,000	21,600	50	1,089,000	....	11.11	222
1913	198	100,340	20,800	42	841,000	....	11.93	239
Maui:								
1920	138	135,896	19,900	48	947,000	44,300	14.35	287
1919	169	132,990	20,000	47	939,000	40,500	14.16	283
1918	231	162,200	23,100	57	1,315,000	50,300	12.33	247
1917	160	147,755	23,600	47	1,108,000	49,300	13.33	267
1916	168	150,311	19,911	55	1,098,247	51,897	13.69	274
1915	174	160,300	19,800	57	1,126,000	44,400	14.24	285
1914	167	145,000	19,400	54	1,054,000	....	13.76	275
1913	152	124,820	19,700	47	929,000	....	13.44	269
Oahu:								
1920	220	128,831	21,500	48	1,034,000	45,400	12.46	249
1919	204	155,085	23,900	49	1,176,000	45,400	13.19	264
1918	193	113,800	22,600	50	1,005,000	47,100	11.32	227
1917	214	145,550	22,200	53	1,174,000	44,200	12.39	248
1916	179	136,690	21,489	52	1,119,448	43,936	12.21	244
1915	205	129,700	21,600	47	1,019,000	46,000	12.73	255
1914	188	133,000	20,700	44	903,000	....	14.73	295
1913	157	124,152	20,500	49	1,003,000	....	12.38	248
Territory of Hawaii:								
1920	175	555,727	114,100	39	4,473,000	247,900	12.42	248
1919	178	600,312	119,700	40	4,744,000	239,900	12.65	253
1918	184	576,700	119,800	41	4,855,000	276,800	11.88	238
1917	190	644,663	123,900	42	5,220,000	245,100	12.35	247
1916	180	592,763	115,419	42	4,859,424	246,332	12.20	244
1915	195	646,000	113,200	46	5,185,000	239,800	12.46	249
1914	183	612,000	112,700	43	4,900,000	....	12.49	250
1913	169	546,524	114,600	39	4,476,000	....	12.21	244

SUGAR—Continued.

TABLE 209.—*Sugar: Wholesale price per pound, on New York market, 1913–1920.*

[Compiled from commercial papers.]

Date.	Raw, centrifugal, 96° polarization.			Refined.								
				Cut loaf.			Granulated, fine or standard.			Soft sugar No. 1.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January–June	3.25	3.73	....	5.05	5.70	....	4.25	4.95	....	4.00	4.65	....
July–December	3.12	3.80	....	5.05	5.60	....	4.15	4.85	....	4.05	4.55	....
1914.												
January–June	2.92	3.48	....	5.05	5.25	....	3.85	4.35	....	3.60	4.10	....
July–December	3.26	6.52	....	5.25	8.40	....	3.85	7.55	....	4.10	7.30	....
1915.												
January–June	3.95	5.02	....	5.85	7.00	....	4.95	6.15	....	4.70	5.85	....
July–December	3.50	5.20	....	5.80	7.05	....	4.90	6.20	....	4.65	5.90	....
1916.												
January–June	4.33	6.52	....	6.65	8.80	....	5.75	7.70	....	5.50	7.50	....
July–December	4.89	6.65	....	7.40	8.80	....	6.25	7.70	....	6.10	7.50	....
1917.												
January–June	4.64	6.52	....	7.90	9.00	....	6.75	7.55	....	6.60	7.35	....
July–December	5.92	7.77	....	9.00	9.90	....	7.50	8.45	....	7.35	8.25	....
1918.												
January–June	6.00	6.00	6.05	8.95	9.65	8.97	7.45	8.20	7.50	7.30	8.00	7.32
July–December	6.00	7.28	6.81	9.00	10.50	9.95	7.50	9.05	8.41	7.35	8.85	8.30
1919.												
January–June	7.28	7.28	7.28	10.50	10.50	10.50	9.00	9.05	9.02	8.85	8.85	8.85
July–December	7.28	13.04	7.61	10.50	10.50	10.50	9.00	9.05	9.02	8.85	8.85	8.85
1920.												
January	12.75	15.00	13.27	....	....	....	15.00	16.00	15.53	....	....	....
February	9.50	13.04	12.98	....	....	....	14.75	16.00	15.47	....	....	....
March	9.50	13.04	11.66	....	....	....	14.00	16.00	14.52	....	....	....
April	12.50	20.06	17.56	....	....	....	14.00	23.00	16.94	....	....	....
May	19.56	23.57	21.05	....	....	....	17.50	26.50	21.39	....	....	....
June	18.26	20.56	19.62	....	....	....	21.50	26.50	22.87	....	....	....
January–June	9.50	23.57	16.02	....	....	....	14.00	26.50	17.79	....	....	....
July	16.29	18.56	17.72	....	....	....	21.00	24.00	22.44	....	....	....
August	11.00	16.29	14.22	....	....	....	17.00	22.00	20.02	....	....	....
September	10.03	12.04	10.88	....	....	....	13.50	17.10	15.18	....	....	....
October	8.52	9.00	8.45	....	....	....	11.00	14.00	12.24	....	....	....
November	5.76	8.26	6.76	....	....	....	8.75	12.00	10.16	....	....	....
December	4.63	5.76	5.24	....	....	....	7.90	9.00	8.44	....	....	....
July–December	4.63	18.56	10.54	....	....	....	7.90	24.00	14.75	....	....	....

SUGAR—Continued.

TABLE 210.—*Sugar: International trade, calendar years 1909–1919.*[1]

[The following kinds and grades have been included under the head of sugar: Brown, white candied, caramel, chancaca (Peru), crystal cube, maple, muscovado, panels. The following have been excluded; "Candy" (meaning confectionery), confectionery, glucose, grape sugar, jaggery, molasses, and sirups. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Argentina	144	142,616	118,658	891	70	21	3,2[illegible]3
Austria-Hungary	1,697,659	....	....	....	....	....	....
Barbados	51,657	66,006	67,052	124,255	116,446	....	....
Belgium	308,952	....	....	....	....	....	50,222
Brazil	76,568	70,239	130,447	120,014	304,585	254,926	153,063
British Guiana	212,393	239,989	263,958	228,140	255,403	211,396	....
British India	53,222	43,207	34,474	53,383	36,350	71,221	52,864
China	29,867	19,040	32,950	25,555	30,871	26,905	....
Cuba	4,019,798	5,574,683	5,731,998	6,564,544	6,441,717	7,293,915	....
Dominican Republic	184,703	223,610	226,634	270,378	289,929	264,624	357,885
Dutch East Indies	2,825,111	2,912,633	2,658,470	3,191,221	2,610,928	3,395,304	....
Egypt	16,171	29,398	58,939	63,533	57,296	37,659	27,974
Fiji	157,633	206,331	191,661	269,983	218,030	141,142	....
France	413,795	244,424	223,520	209,142	190,458	136,672	173,835
Germany	1,746,322	....	....	....	....	....	....
Guadeloupe	75,270	87,340	75,230	75,184	68,056	58,651	....
Martinique	85,110	85,979	85,814	75,934	46,034	45,661	....
Mauritius	452,510	638,200	497,332	508,581	421,023	403,931	....
Netherlands	400,980	333,000	327,486	101,819	69,427	51,027	86,240
Peru	293,472	389,489	485,580	526,920	467,464	436,485	599,920
Philippine Islands	358,865	521,383	465,199	744,030	453,946	602,425	....
Reunion	83,316	72,941	77,710	92,928	74,114	83,246	....
Russia	587,028	281,218	206,415	117,078	....	....	....
Trinidad and Tobago	87,510	107,953	132,710	129,377	140,382	78,633	....
United Kingdom	65,207	33,975	11,292	10,296	2,470	1,804	2,820
United States	79,368	390,409	963,575	1,576,652	1,010,796	402,296	1,475,408
Other countries	581,510	690,943	460,572	572,968	857,361	580,401	....
Total	14,944,141	13,405,006	13,527.676	15,652,806	14,163,156	14,583,346	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	103,380	14,068	79	66,930	353,127	73,371	181,150
Australia	152,465	29,428	260,127	181,847	35,408	117,770	....
British India	1,431,980	1,211,769	1,091,344	992,855	928,759	1,190,562	941,930
British South Africa	61,282	50,098	17,592	7,750	28,337	45,091	6,226
Canada	595,785	691,166	599,701	700,600	794,118	657,926	1,059,898
Chile	169,931	185,425	156,612	167,748	199,106	195,774	....
China	687,243	835,467	636,877	689,472	826,277	1,165,173	....
Denmark	43,627	49,794	24,087	15,354	3,577	108	....
Egypt	86,041	27,964	45,226	16,477	24,076	40,704	27,574
Finland	100,153	97,524	101,774	110,510	....	....	....
France	372,395	383,243	1,188,078	1,254,416	1,191,105	375,505	1,254,263
Italy	18,499	10,774	6,776	166,849	123,964	81,638	175,224
Japan	353,885	441,451	276,999	213,485	175,482	496,720	....
Netherlands	165,443	226,266	37,281	17,397	1,480	25	105,134
New Zealand	125,924	108,975	141,692	135,115	148,332	111,367	....
Norway	104,651	130,787	129,930	136,824	124,531	75,635	....
Persia	218,703	194,564	....	....	....	....	....
Portugal	79,262	83,927	71,843	65,034	73,515	....	....
Singapore	163,220	153,361	....	....	....	....	....
Switzerland	236,403	296,645	267,724	243,296	235,560	160,649	231,322
United Kingdom	3,707,211	3,668,812	3,574,781	2,985,034	2,413,410	2,016,755	3,433,783
United States [2]	4,245,034	5,417,995	5,286,218	5,532,322	4,944,089	5,170,976	7,023,620
Other countries	1,027,604	493,098	387,915	388,871	412,653	297,280	....
Total	14,250,121	14,802,601	14,302,686	14,088,188	13,036,904	12,273,029	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Not including receipts from Hawaii, amounting to an average for 5 years 1909–1913 of 1,089,659,793, in 1916 to 1,160,018,550, and in 1917 to 1,253,562,475 pounds, and from Porto Rico, to an average for the 5 years 1909–1913 of 642,628,376, in 1916 to 907,373,407, and in 1917 to 942,439,175 pounds.

SUGAR—Continued.

Table 211.—*Sugar production of undermentioned countries, campaigns of 1909–10 to 1919–20.*

BEET SUGAR (RAW).

Country.	Average, 1909–10 to 1913–14.	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
NORTH AMERICA.	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*
United States	609,620	722,054	874,220	820,657	765,207	760,950	726,451
Canada	11,457	15,657	19,758	8,612	11,688	25,046	18,920
Total	621,077	737,711	893,978	829,269	776,895	785,996	745,371
EUROPE.							
Austria	43,194	....	....	....	....	....	5,657
Belgium	276,075	214,557	119,926	140,473	135,809	77,954	151,515
Bulgaria	7,688	24,097	12,777	9,945	11,543	3,743	13,074
Czecho-Slovakia	1,017,237	1,004,163	812,052	804,679	584,219	699,960	524,559
Denmark	127,602	167,803	143,475	123,623	148,700	155,755	176,368
Finland	....	....	....	....	....	....	203
France	759,426	333,964	149,802	204,405	225,752	121,374	170,426
Germany	2,296,131	2,720,635	1,678,402	1,721,250	1,726,483	1,483,809	808,304
Hungary	467,742	461,781	....	....	....	44,927	8,953
Italy	208,675	165,583	165,781	159,690	102,100	119,524	185,001
Jugo-Slavia	20,948	....	....	....	....	....	1,960
Netherlands	246,341	316,346	263,826	286,102	214,891	181,986	252,169
Poland	279,374	....	....	....	....	....	496,035
Rumania	59,934	....	....	....	....	....	1,213
Russia	1,726,231	1,897,445	1,823,602	1,456,800	1,133,804	317,793	85,537
Spain	115,727	112,231	117,334	139,260	154,317	136,088	220,460
Sweden	153,581	169,880	140,380	140,000	140,000	140,536	159,867
Switzerland	4,390	3,208	2,646	1,984	9,921	12,665	9,730
Total	7,819,296	7,591,593	5,430,003	5,188,211	4,587,539	3,604,114	3,271,031
OCEANIA.							
Australia	719	1,324	627	2,182	1,904	....	....
Total beet sugar	8,441,092	8,330,628	6,324,608	6,019,662	5,366,338	4,390,110	4,016,402

CANE SUGAR.

Country.	Average, 1909–10 to 1913–14.	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
NORTH AMERICA.							
United States:							
Louisiana	301,173	242,700	137,500	303,900	243,600	280,900	121,000
Texas	9,664	3,920	1,120	7,000	2,240	3,500	1,125
Hawaii	567,495	646,000	592,763	644,663	576,700	600,312	556,343
Porto Rico	363,474	346,490	483,590	503,081	453,796	406,003	485,884
Virgin Islands, United States	9,212	4,488	16,503	....	....	10,080	13,888
Central America:							
British Honduras	575	840	784	....	....	....	....
Costa Rica	2,922	2,926	5,740	6,538	....	4,225	....
Guatemala	8,284	27,558	33,069	33,069	33,069	25,142	14,816
Honduras	....	....	2,960	....	....	....	....
Nicaragua	5,000	782	10,000	15,000	12,000	12,000	....
Salvador	13,616	13,498	18,818	....	20,385	30,515	....
Mexico	163,030	....	71,650	55,115	38,580	78,400	103,040
West Indies:							
British—							
Antigua	12,919	17,295	12,218	20,769	19,181	14,679	18,667
Barbados	27,788	32,932	36,790	65,471	58,195	84,304	56,000
Jamaica	23,856	25,852	25,562	43,731	38,291	48,160	52,500
Montserrat	222	96	83	468	329	....	....
St. Christopher-Nevis	13,252	10,080	10,244	19,040	16,854	....	....
St. Kitts	....	6,574	6,863	12,982	10,194	12,209	16,800
St. Lucia	5,436	4,255	5,184	5,011	3,516	4,100	4,928
St. Vincent	349	141	253	599	632	638	1,272
Trinidad and Tobago	51,275	62,147	65,881	71,939	79,140	50,687	65,426
Virgin Islands	473	36	39	28	....	....	....
Cuba	2,295,353	2,967,427	3,436,649	3,441,771	3,957,061	3,443,145	4,183,676
Dominican Republic	106,539	120,366	140,443	149,943	172,800	186,682	225,920
French—							
Guadeloupe	40,917	39,278	39,256	35,690	30,864	29,796	34,720
Martinique[1]	42,567	42,908	37,968	23,017	22,831	11,230	24,540
Total	4,065,391	4,618,589	5,191,930	5,458,825	5,790,258	5,336,707	5,980,645

[1] Exports.

SUGAR—Continued.

TABLE 211.—*Sugar production of undermentioned countries, campaigns of 1909–10 to 1919–20*—Continued.

CANE SUGAR—Continued.

Country.	Average, 1909–10 to 1913–14.	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
SOUTH AMERICA.	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*
Argentina	193,853	370,324	164,572	92,669	97,085	139,463	248,018
Brazil	[1] 38,284	343,653	486,114	413,362	469,580	440,479	579,938
Colombia						4,712	5,655
Guiana:							
British	106,194	133,382	128,007	121,163	120,467	90,350	107,520
Dutch	12,571	16,256	9,094	15,829	11,210	8,960	13,440
Paraguay	1,363	1,693	2,355	869	808	619	2,745
Peru	210,608	289,729	304,236	279,077	275,575	336,000	392,000
Venezuela							243
Total	562,873	1,155,037	1,094,378	922,923	974,725	1,020,583	1,349,559
EUROPE.							
Spain	17,059	6,168	4,700	5,053	6,297	7,295	6,667
ASIA.							
British India	2,614,326	2,757,440	2,950,080	3,057,600	3,708,320	2,617,440	3,361,086
Formosa	192,299	229,801	353,920	504,972	518,089	379,323	321,614
Japan	75,718	78,397	99,914	141,438	102,428		
Java	1,513,736	1,054,030	1,796,558	2,008,521	1,960,118	1,478,103	1,496,055
Philippine Islands	170,447	421,192	412,274	425,266	474,745	453,346	466,854
Total	4,566,526	4,540,860	5,612,746	6,137,797	6,763,700	4,928,212	5,645,609
AFRICA.							
Egypt	67,128	83,486	109,088	112,080	87,620	83,663	100,800
Madeira Islands						2,786	1,874
Mauritius	233,671	305,734	236,463	230,419	248,531	278,187	267,308
Natal	88,165	102,000	112,000	128,240	119,000	164,080	168,000
Portuguese East Africa	27,800	61,600	44,800	61,600	56,000	56,000	39,200
Reunion	41,658	37,258	43,320	49,604	46,462	55,115	36,216
Total	458,422	590,078	545,671	581,943	557,613	639,831	613,398
OCEANIA.							
Australia	216,331	275,381	179,788	216,201	354,941	219,358	170,856
Fiji	84,629	106,794	105,578	134,992	109,014	76,171	67,200
Total	300,960	382,175	285,366	351,193	463,955	295,529	238,056
Total cane	9,971,231	11,292,907	12,734,791	13,457,734	14,556,548	12,228,157	13,838,934
Total beet and cane	18,412,323	19,523,535	19,059,399	19,477,196	19,922,886	16,618,267	17,850,336

TABLE 212.—*Sugar: Total production of countries mentioned in Table 211, 1895–96 to 1918–19.*

Year.	Production.			Year.	Production.		
	Cane.[2]	Beet.	Total.		Cane.[2]	Beet.	Total.
	Short tons.	*Short tons.*	*Short tons.*		*Short tons.*	*Short tons.*	*Short tons.*
1895–96	3,259,000	4,832,000	8,091,000	1908–9	8,654,000	7,350,000	16,004,000
1896–97	3,171,000	5,549,000	8,720,000	1909–10	9,423,000	6,991,000	16,414,000
1897–98	3,206,000	5,457,000	8,663,000	1910–11	9,540,000	9,042,000	18,582,000
1898–99	3,355,000	5,616,000	8,971,000	1911–12	10,275,000	7,072,000	17,347,000
1899–1900	3,389,000	6,262,000	9,651,000	1912–13	10,908,000	9,509,769	20,518,000
1900–1	4,084,000	6,795,000	10,879,000	1913–14	11,270,200	9,433,783	20,703,983
1901–2	6,818,000	7,743,000	14,561,000	1914–15	11,292,907	8,330,628	19,523,535
1902–3	6,782,000	6,454,000	13,236,000	1915–16	12,734,791	6,324,608	19,059,399
1903–4	6,909,000	6,835,000	13,744,000	1916–17	13,457,734	6,019,662	19,477,396
1904–5	7,662,000	5,525,000	13,187,000	1917–18	14,556,548	5,366,338	19,922,886
1905–6	7,551,000	8,090,000	15,641,000	1918–19	12,228,157	4,390,110	16,618,267
1906–7	8,365,000	7,587,000	15,952,000	1919–20	13,833,934	4,016,402	17,850,336
1907–8	7,926,000	7,390,000	15,316,000				

[1] Exports.
[2] Prior to 1901–2 these figures include exports instead of production for British India.

SUGAR—Continued.

TABLE 213.—*Beet and beet-sugar production of undermentioned countries.*

Country and year.	Factories in operation.	Sugar made, raw.	Beets used for sugar.			Average extraction of sugar.	
			Area harvested.	Average yield per acre.	Quantity worked.	Per centage of weight of beets used.	Per short ton of beets used.
Austria-Hungary:	*Number.*	*Short tons.*	*Acres.*	*Short tons.*	*Short tons.*	*Per cent.*	*Pounds.*
1910-11	214	1,549,102	918,201	11.95	11,038,503	17.5	281
1911-12	210	1,180,605	968,771	8.18	8,623,578	16.6	274
1912-13	218	2,093,439	1,088,088	13.00	13,911,305	14.8	301
Belgium:			*Area cultivated.*		*Produced.*	*P. c. of wt. of beets produced.*	*Per ton of beets produced.*
1910-11	92	299,035	148,858	13.41	1,996,977	14.97	299
1911-12	89	258,780	145,119	11.45	1,660,872	15.58	312
1912-13	88	309,308	152,913	12.47	1,907,358	16.22	324
1913-14	84	249,395	129,527	11.85	1,534,311	16.25	325
Denmark:							
1910-11	8	110,792	....	....	817,381	13.56	271
1911-12	8	128,032	....	....	809,616	15.81	316
1912-13	9	148,447	79,986	14.49	1,159,369	12.80	256
1913-14	9	179,002	....	....	1,025,140	17.46	349
1914-15	9	167,803	79,000	....	910,000	....	....
1915-16	9	143,475	77,787	....	811,351	....	....
1916-17	9	123,623	76,020	....	972,965	....	....
1917-18	9	148,700	89,393	....	1,041,017	....	....
France:		*Refined.*	*Area harvested.*		*Worked.*	*P. c. of wt. of beets used.*	*Per ton of beets used.*
1910-11	239	717,033	549,969	10.76	6,426,226	11.80	236
1911-12	220	512,986	555,575	8.09	4,669,083	11.41	228
1912-13	213	967,440	566,539	12.99	7,960,926	13.15	263
1913-14	206	790,790	534,230	12.24	6,539,725	12.09	242
1914-15	69	333,953	242,781	11.92	2,892,878	11.54	231
1915-16	64	149,801	156,189	8.65	1,263,414	11.80	237
1916-17	65	204,405	170,417	10.32	1,759,125	11.60	....
1917-18	61	220,752	163,840	10.74	1,759,625	12.50	....
1918-19	51	126,374	148,020	7.10	1,051,582	11.54	....
Germany:[1]		*Raw.*					
1910-11	354	2,770,001	1,180,913	14.72	17,360,003	15.96	319
1911-12	342	1,551,797	1,247,213	8.03	9,987,473	15.54	311
1912-13	342	2,901,564	1,353,181	13.56	18,344,738	15.82	316
1913-14	341	2,885,752	1,316,655	14.19	18,672,939	15.45	309
1914-15	333	2,720,635	1,350,985	13.07	17,597,688	15.46	314
1516-16	320	1,678,402	900,759	11.78	10,609,756	15.82	305
1916-17	316	1,721,250	989,243	10.66	10,549,867	16.32	326
1917-18	312	1,726,483	950,275	10.71	9,076,862	16.97	371
1918-19	307	1,483,807	905,634	10.62	9,599,942	15.46	309
Italy:		*Refined.*	*Area cultivated.*				
1910-11	35	190,901	124,044	14.92	1,698,551	11.24	225
1911-12	37	174,894	131,260	13.30	1,621,760	10.78	216
1912-13	37	218,628	133,434	14.40	1,879,328	11.63	233
1913-14	37	336,823	152,700	19.70	2,991,816	11.25	225
1914-15	30	165,583	100,570	....	1,422,235	....	....
1915-16	36	165,781	122,809	....	1,582,542	....	....
1916-17	33	159,690	123,056	....	1,375,310	....	....
1917-18	34	102,100	116,137	....	924,361	....	....
Netherlands:							
1910-11	27	219,947	138,554	12.94	1,678,803	13.10	262
1911-12	27	265,401	137,388	16.06	1,896,187	14.00	280
1912-13	27	315,775	160,180	14.99	2,228,851	14.17	283
1913-14	27	231,073	149,001	12.27	1,705,878	13.55	271
1914-15	27	316,346	156,251	14.06	2,193,577	14.42	288
1915-16	26	263,821	139,644	13.52	1,889,376	....	....
1916-17	28	286,102	159,911	11.83	1,892,471	....	....
1917-18	23	214,891	112,937	14.23	1,607,443	....	....
1918-19	20	181,986	....	....	....	....	....

[1] The production of sugar in Germany, including refined from imported raw sugar, was 2,983,085 short tons in 1912-13 and 2,993,704 in 1913-14.

SUGAR—Continued.

TABLE 213.—*Beet and beet sugar production of undermentioned countries*—Continued.

Country and year.	Factories in operation.	Sugar made, raw.	Beets used for sugar.			Average extraction of sugar.	
			Average harvested.	Average yield per acre.	Quantity worked.	Per centage of weight of beets used.	Per short ton of beets used.
Russia:	*Number.*	*Raw.*	*Area cultivated.*	*Short tons.*	*Worked.*	*P. c. of wt. of beets used.*	*Per ton of beets used.*
1910-11	276	2,074,410	1,631,188	8.9	14,437,305	14.61	292
1911-12	281	2,036,990	1,923,539	7.8	14,754,312	13.84	277
1912-13	287	1,361,842	1,847,313	6.4	11,538,078	11.73	235
1913-14	293	1,680,893	1,756,160	7.7	13,436,058	12.51	250
1914-15	265	1,958,975	1,941,122	7.4	13,979,662	14.01	280
1915-16	235	1,697,356	1,748,466	7.0	12,324,612	13.77	275
Spain:							
1910-11	33	68,743	(1)		532,882	12.90	258
1911-12	32	102,859	90,787		872,834	11.73	236
1912-13	33	171,839	105,213		1,302,871	11.33	264
1913-14	31	186,680	146,745		1,478,114	12.62	252
1914-15	(2)	112,231	78,642	(1)	813,790	12.08	....
1915-16	27	117,334	99,114		921,013	10.65	....
1916-17	27	139,280	134,212		1,108,355	10.92	....
1917-18	31	154,317	146,456		1,341,258	10.81	....
Sweden:							
1910-11	24	191,713	86,816	13.56	1,218,166	15.53	315
1911-12	24	140,409	71,790	14.83	908,372	15.27	309
1912-13	24	145,462	66,944	13.95	922,083	15.59	316
1913-14	24	151,132	71,264	....	975,840	....	....
1914-15	24	169,880	80,209	....	1,074,091	....	....
1915-16	24	140,380	79,942	....	908,827	....	....
United States:		*Refined.*	*Area harvested.*				
1910-11	61	510,172	398,029	10.17	4,047,292	12.61	252
1911-12	66	599,500	473,877	10.68	5,062,333	11.84	237
1912-13	73	692,556	555,300	9.41	5,224,377	13.26	265
1913-14	71	733,401	580,006	9.76	5,659,462	12.96	259
1914-15	60	722,054	483,400	10.9	5,288,500	13.65	273
1915-16	67	874,220	611,301	10.1	6,150,293	14.21	267
1916-17	74	820,657	665,308	8.90	5,919,673	13.86	277
1917-18	91	765,207	664,797	8.46	5,625,545	13.60	272
1918-19	89	760,950	594,010	9.39	5,577,506	13.64	273
1919-20	89	726,451	692,455	8.50	5,887,557	12.34	239
1920-21 [2]	99	1,109,600	882,000	....	8,545,000	12.99	....

[1] No data. [2] Preliminary.

SUGAR—Continued.

TABLE 214.—*Cane and cane-sugar production of undermentioned countries.*

Country and year.	Factories in operation.	Sugar made.	Cane used for sugar.			Average extraction of sugar.
			Area harvested.	Average per acre.	Quantity worked.	Per ton of cane used.
Argentina:	*Number.*	*Short tons.*	*Acres cultivated.*	*Short tons.*	*Short tons.*	*Pounds.*
1910–11	(1)	163,701	178,060	(1)	(1)	(1)
1911–12	(1)	198,515	230,866	(1)	(1)	(1)
1912–13	39	162,313	232,830	(1)	2,338,594	139
1913–14	38	304,389	263,656	(1)	3,451,321	176
1914–15	37	370,324	269,833	(1)	4,027,067	184
Australia:			*Harvested.*		*Produced.*	
1910–11	53	253,131	100,237	22.36	2,240,849	226
1911–12	53	210,292	101,010	18.65	1,884,120	223
1912–13	50	144,776	84,279	15.09	1,271,358	228
1913–14	51	296,832	109,001	23.34	2,544,145	202
1914–15	....	275,381	114,025	20.66	2,356,748	203
1915–16	47	179,788	100,489	14.60	1,467,496	208
Cuba:			*Cultivated.*			
1910–11	171	1,670,151	(2)	(2)	14,736,981	227
1911–12	172	2,142,420	(2)	(2)	20,679,593	207
1912–13	171	2,737,264	1,340,139	(2)	25,137,684	218
1913–14	170	2,891,281	1,334,070	(2)	25,644,949	226
1914–15	177	2,967,427	....	....	28,068,993	....
1915–16	....	3,398,385	....	....	26,324,706	....
1916–17	....	3,421,897	....	....	28,149,841	....
Hawaii:			*Harvested.*			
1911–12	(1)	595,038	113,000	42.0	4,774,000	249
1912–13	(1)	546,524	114,600	39.0	4,476,000	244
1913–14	46	612,000	112,700	45.0	5,094,000	240
1914–15	45	646,000	113,200	46.0	5,185,000	249
1915–16	(1)	592,763	115,419	42.0	4,859,424	244
1916–17	(1)	644,663	123,900	42.0	5,220,000	247
1917–18	(1)	576,700	119,800	41.0	4,855,090	238
1918–19	(1)	600,312	119,700	40.0	4,744,000	253
1919–20	(1)	555,727	114,100	39.2	4,473,000	248
Japan:			*Cultivated.*			
1910–11	13	72,454	49,166	18.49	892,662	162
1911–12	14	75,797	52,153	18.16	941,550	161
1912–13	17	68,867	51,293	17.15	879,624	157
1913–14	16	72,613	53,300	17.91	954,758	152
Java (factory plantations):			*Harvested.*			
1910–11	189	1,583,178	321,720	46.43	14,936,035	212
1911–12	193	1,424,657	336,021	40.71	13,679,962	208
1912–13	191	1,527,584	340,739	45.11	15,370,765	199
Spain:			*Cultivated.*			
1910–11	27	22,371	11,666	21.9	258,138	173
1911–12	23	17,831	9,983	16.5	167,092	213
1912–13	21	14,585	9,844	15.6	153,707	190
1913–14	22	8,131	4,581	17.4	79,719	204
1914–15	(1)	6,168	4,717	(1)	70,410	(1)
1915–16	16	4,700	2,950	16.59	48,937	194
1916–17	16	5,053	4,621	....	70,286	....
United States (Louisiana):			*Harvested for sugar.*			
1911–12	188	352,874	310,000	19.0	5,887,292	120
1912–13	126	153,573	197,000	11.0	2,162,574	142
1913–14	153	292,698	248,000	17.0	4,214,000	139
1914–15	149	242,700	213,000	15.0	3,199,000	152
1915–16	136	137,500	183,000	11.0	2,018,000	135
1916–17	150	303,900	221,000	18.0	4,072,000	149
1917–18	140	243,600	244,000	15.6	3,813,000	128
1918–19	134	280,900	231,200	18.0	4,170,000	135
1919–20	....	115,590	176,500	10.0	1,765,000	131
1920–21	....	186,000	196,000	....	2,935,000	....

[1] No data. [2] Preliminary.

SUGAR—Continued.

TABLE 215.—*Sugar beets: Area and production in undermentioned countries, 1909–1919.*

Country.	Area.				Production.			
	Average [1] 1909–1913	1917	1918	1919	Average [1] 1909–1913.	1917	1918	1919
NORTH AMERICA.	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 acres.*	*1,000 short tons.*	*1,000 short tons.*	*1,000 short tons.*	*1,000 short tons.*
United States	568	665	594	692	5,555	5,980	5,949	6,421
Canada	18	14	18	24	174	118	180	240
Total	586	679	612	726	5,729	6,098	6,129	6,661
EUROPE.								
Austria [2]	642	....	21	13	8,202	....	188	83
Hungary proper [2]	432	....	....	....	5,275	....	....	....
Croatia-Slavonia [2]	10	....	....	....	73	....	....	....
Bosnia-Herzegovina [2]	3	....	....	....	12	....	....	....
Belgium	142	....	....	112	1,720	....	....	793
Bulgaria [2]	8	30	33	....	81	....	....	....
Czecho-Slovakia	....	....	....	[3] 431	....	....	....	[3] 3,969
Denmark	80	76	94	102	1,025	973	1,041	1,132
England	4	(4)	(4)	(4)	....	....	....	....
Finland	....	....	....	1	....	....	....	17
France [2]	623	[5] 180	[6] 163	[6] 165	7,254	[5] 2,169	[6] 1,259	[6] 1,375
Alsace-Lorraine	....	1	1	....	....	16	11	....
Germany [2]	1,335	[6] 992	[6] 993	[6, 7] 646	18,509	[6] 11,009	[6] 10,895	[6] 6,413
Italy	143	116	106	106	2,465	1,166	1,250	1,671
Netherlands	154	115	95	122	2,117	1,826	1,372	1,709
Roumania [2]	34	....	[8] 18	[9] 8	316	....	[8] 54	[9] 37
Russia proper [2]	1,578	[7] 1,100	....	....	12,119	....	....	....
Poland [2]	170	....	....	[7, 10] 60	1,399	....	....	....
Northern Caucasia [2] (Kuban)	8	....	....	....	84	....	....	....
Spain	126	146	163	133	2,130	923	742	1,169
Sweden	69	78	75	90	940	986	895	1,031
Switzerland	2	1	1	(4)	21	14	14	11
Total	5,563	....	....	....	63,742	....	....	....
Grand total	6,149	....	....	....	69,471	....	....	....

[1] Five-year average except in a few cases where five-year statistics were unavailable.
[2] Old boundaries.
[3] Moravia and Bohemia only.
[4] Less than 500 acres.
[6] Excludes invaded territory in which 115,900 acres were under sugar-beets in 1914.
[6] Excludes Alsace-Lorraine.
[7] Unofficial.
[8] Includes Bessarabia but excludes Dobrudja.
[9] Former Kingdom, Bessarabia and Bukowina.
[10] New boundaries.

MAPLE SUGAR AND SIRUP.

TABLE 216.—*Maple sugar and sirup production, 1909, 1918, 1919, and 1920.*

[Figures for 1909 are from the United States census; all others are based upon reports from field agents and correspondents of the Bureau of Crop Estimates.]

State and year.	Trees tapped.	Sugar made.	Sirup made.	Average per tree.	
				As sugar.	As sirup.
	Number.	*Pounds.*	*Gallons.*	*Pounds.*	*Gallon.*
Maine:					
1920	320,000	35,840	59,520	1.6	0.20
1919	304,000	63,232	41,496	1.3	.16
1918	290,000	46,400	52,200	1.6	.20
1909	252,764	15,388	43,971	1.45	.18
New Hampshire:					
1920	930,000	334,800	167,400	1.8	.22
1919	870,000	445,440	118,320	1.6	.20
1918	870,000	556,800	147,900	2.0	.25
1909	792,147	558,811	111,500	1.83	.23
Vermont:					
1920	5,665,000	3,965,000	900,000	2.0	.25
1919	5,665,000	4,894,560	521,180	1.6	.20
1918	5,500,000	6,236,000	664,100	2.10	.26
1909	5,585,632	7,726,817	409,953	1.98	.25
Massachusetts:					
1920	309,500	158,700	53,535	1.9	.25
1919	273,900	138,045	44,374	1.8	.23
1918	273,900	182,600	50,800	2.15	.27
1909	256,501	156,952	53,091	2.27	.28
Connecticut:					
1920	15,525	4,600	5,000	2.9	.35
1919	13,500	5,832	2,308	1.8	.22
1918	13,500	8,900	3,900	3.0	.38
1909	12,296	10,207	4,236	3.65	.46
New York:					
1920	6,122,000	2,204,000	1,255,000	2.0	.25
1919	6,062,000	3,161,000	1,401,000	2.37	.30
1918	6,236,000	3,732,000	1,755,000	2.85	.35
1909	4,948,784	3,160,300	993,242	2.24	.28
Pennsylvania:					
1920	1,300,000	508,300	310,200	2.3	.29
1919	1,244,000	686,800	318,800	2.6	.33
1918	1,220,000	993,000	440,000	3.7	.46
1909	1,298,005	1,188,049	391,242	3.33	.42
Maryland:					
1920	76,300	119,000	10,000	2.6	.30
1919	76,300	221,300	20,000	5.0	.62
1918	74,800	179,500	15,000	4.0	.50
1909	79,658	351,908	12,172	5.64	.70
West Virginia:					
1920	60,000	86,000	16,000	3.6	.45
1919	100,000	160,000	30,000	4.0	.50
1918	105,000	147,000	27,500	3.5	.44
1909	97,274	140,060	31,176	4.0	.50
Ohio:					
1920	2,230,000	41,600	427,400	1.6	.20
1919	2,350,000	110,320	752,310	2.6	.35
1918	2,660,000	558,600	1,093,900	3.5	.44
1909	3,170,828	257,592	1,323,431	3.42	.43
Indiana:					
1920	695,000	6,000	125,000	1.4	.18
1919	700,000	200,000	273,000	3.4	.43
1918	700,000	238,000	267,800	3.4	.42
1909	742,586	33,419	273,728	2.99	.37
Michigan:					
1920	848,000	47,100	190,200	1.8	.22
1919	874,000	57,700	233,100	2.2	.28
1918	930,000	364,600	279,900	2.8	.35
1909	986,737	293,301	269,093	2.48	.31
Wisconsin:					
1920	460,000	17,700	86,300	1.54	.19
1919	442,000	24,400	98,600	1.84	.22
1918	425,000	26,500	107,200	2.08	.26
1909	449,727	27,199	124,117	2.26	.28
Total 13 States:					
1920	19,031,325	7,528,640	3,605,555	1.91	.24
1919	18,974,700	10,168,629	3,854,488	2.16	.27
1918	19,298,200	13,270,900	4,905,200	2.72	.35
1909	18,672,939	13,920,003	4,040,952	2.48	.31

NOTE.—These 13 States produced, in 1909, 99 per cent of the maple-sugar crops of the United States and 98.4 per cent of the maple sirup.

MAPLE SUGAR AND SIRUP—Continued.

TABLE 217.—*Maple sugar and sirup: Farm price, 15th of month, 1914–1920.*

Date.	Sugar (cents per pound).							Sirup (dollars per gallon).						
	1920	1919	1918	1917	1916	1915	1914	1920	1919	1918	1917	1916	1915	1914
Feb. 15	29.3	22.0	18.8	14.7	12.6	11.6	......	2.35	1.86	1.58	1.22	1.08	1.06	......
Mar. 15	31.6	25.3	20.5	14.7	13.4	12.5	12.4	2.58	1.99	1.76	1.30	1.11	1.10	1.10
Apr. 15	37.0	26.9	22.5	16.3	13.9	12.9	12.5	2.92	2.03	1.80	1.33	1.17	1.10	1.10
May 15	36.0	26.3	22.6	16.2	13.6	12.3	12.3	2.93	2.02	1.85	1.34	1.15	1.07	1.10
June 15	35.1	26.2	22.0	15.9	13.7	12.4	12.2	2.84	2.19	1.85	1.33	1.16	1.12	1.12

SORGHUM FOR SIRUP.

TABLE 218.—*Sorghum for sirup: Acreage, production, and value, by States, 1920, and totals 1917–1919.*

State and year.	Acreage.	Average yield per acre.	Production of sirup.	Average farm price per gallon Dec. 1.	Farm value Dec. 1.
	Acres.	*Gallons.*	*Gallons.*	*Cents.*	*Dollars.*
Virginia	11,000	100	1,100,000	105	1,155,000
West Virginia	5,000	100	500,000	135	675,000
North Carolina	37,000	100	3,700,000	100	3,700,000
South Carolina	15,000	100	1,500,000	100	1,500,000
Georgia	15,000	94	1,410,000	104	1,466,000
Florida	600	140	84,000	100	84,000
Ohio	5,900	91	537,000	152	816,000
Indiana	15,000	82	1,230,000	140	1,722,000
Illinois	8,900	75	668,000	145	969,000
Wisconsin	4,000	75	300,000	180	540,000
Minnesota	3,000	100	300,000	150	450,000
Iowa	5,100	96	490,000	143	701,000
Missouri	49,000	83	4,067,000	125	5,084,000
Nebraska	2,000	95	190,000	135	256,000
Kansas	5,000	86	430,000	125	538,000
Kentucky	51,000	95	4,845,000	107	5,184,000
Tennessee	20,000	90	1,800,000	101	1,818,000
Alabama	90,000	99	8,910,000	90	8,019,000
Mississippi	72,000	90	6,480,000	90	5,832,000
Louisiana	600	110	66,000	100	66,000
Texas	7,900	94	743,000	105	780,000
Oklahoma	7,400	94	696,000	108	752,000
Arkansas	42,000	90	3,780,000	105	3,969,000
Utah	500	100	50,000	125	62,000
Total	472,900	92.8	43,876,000	105.2	46,138,000
1919	429,500	82.4	35,409,000	110.3	39,054,000
1918	374,800	79.1	29,643,000	96.3	28,532,000
1917	415,200	90.3	37,472,000	69.5	26,055,000

TEA.

TABLE 219.—*Tea: International trade, calendar years 1909–1919.*[1]

["Tea" includes tea leaves only and excludes dust, sweepings, and yerba maté. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
British India	267,887	292,607	319,864	299,811	299,180	378,075	375,390
Ceylon	189,016	193,584	215,633	203,256	195,232	180,818	....
China	197,997	197,785	233,474	204,672	149,342	53,479	....
Dutch East Indies	46,675	66,425	100,402	96,929	76,710	66,047	....
Formosa	23,640	22,936	22,816	21,455	14,812	24,848	....
Japan	35,823	35,077	41,441	46,273	61,765	46,825	....
Singapore	2,575	2,717	....	....	....	....	....
Other countries	6,991	7,760	5,173	861	214	96	....
Total	770,604	881,891	938,803	873,257	797,255	750,188	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	3,890	3,103	3,012	3,349	2,381	4,037	3,983
Australia	35,442	41,622	44,295	40,764	37,390	45,615	....
Austria-Hungary	3,424	....	....	....	....	....	....
British India	8,002	8,816	12,101	10,700	13,247	17,199	15,014
British South Africa	5,462	6,246	6,867	6,597	8,930	10,510	7,584
Canada	37,927	39,035	42,855	36,678	52,145	29,964	27,026
Chile	3,505	2,787	3,017	4,439	3,659	3,538	....
China	18,890	22,778	24,337	30,944	25,259	6,338	....
Dutch East Indies	6,742	9,110	7,577	7,921	7,976	7,528	....
France	2,806	4,366	6,260	5,834	5,196	3,203	4,626
French Indo-China	3,295	2,634	2,148	....	....	....	....
Germany	8,964	....	....	....	....	....	....
Netherlands	11,383	14,244	15,678	18,075	10,417	1,412	63,710
New Zealand	7,542	9,952	9,150	7,982	9,478	9,692	....
Persia	9,446	6,302	....	....	....	....	....
Russia	157,704	172,558	184,708	172,843	....	....	....
Singapore	6,009	6,290	....	....	....	....	....
United Kingdom	293,045	317,664	317,429	302,033	277,436	310,687	388,466
United States	98,897	97,810	106,106	104,767	126,795	134,418	80,963
Other countries	34,294	23,578	21,643	19,855	19,155	17,547	....
Total	756,669	788,895	807,183	772,781	599,464	601,688	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

TEA—Continued.

TABLE 220.—*Tea: Wholesale price per pound, on New York market, 1913–1920.*

[Compiled from commercial papers.]

Date.	Foochow, fair to fine.			Formosa, fine to choice.			Japan, pan-fired.			India, orange pekoe.			Ceylon, orange pekoe.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January–June	12	22	.....	24	39	.....	13½	35	.....	18½	24	.....	18½	24	.....
July–December	12	22	.....	24	39	.....	13½	28	.....	18½	21	.....	18½	24	.....
1914.															
January–June	12	22	.....	24	39	.....	12½	30	.....	18½	21	.....	18½	24	.....
July–December	12½	22	.....	23	39	.....	12½	38	.....	18½	27	.....	18½	26	.....
1915.															
January–June	15	22	.....	23	39	.....	18	35	.....	.....	.....	.....	21	30	.....
July–December	17	22	.....	23	39	.....	18	40	.....	24	32	.....	24	31	.....
1916.															
January–June	17½	21	.....	23	39	.....	16	35½	.....	24	30	.....	24	30	.....
July–December	17½	21	.....	23	39	.....	16	35	.....	28	30	.....	28	30	.....
1917.															
January–June	17½	26	.....	23	60	.....	16	40	.....	28	47	.....	28	53	.....
July–December	22½	27	.....	40	60	.....	21	40	.....	39	45	.....	40	50	.....
1918.															
January–June	26½	27	26.8	35	60	49.8	24	40	32.1	35	50	42.8	36	50	41.6
July–December	26½	30½	29.8	35	60	47.8	25	45	35.6	35	50	42.5	36	45	40.5
1919.															
January–June	29	30½	29.8	33	62	47.3	24	50	34.6	30	50	33.6	30	45	37.4
July–December	29	30½	29.8	23	62	48.0	25	60	40.7	30	45	35.4	38	50	46.4
1920.															
January	.....	.....	.....	36	62	49.0	25	60	42.5	40	45	42.5	44	50	46.1
February	.....	.....	.....	36	62	49.0	25	60	42.5	40	45	42.5	44	45	44.5
March	.....	.....	.....	36	62	49.0	25	60	42.5	38	45	41.6	44	45	44.5
April	.....	.....	.....	36	62	49.0	25	60	42.5	38	45	41.5	44	45	44.5
May	.....	.....	.....	36	62	49.0	25	65	39.0	32	45	34.5	35	55	44.9
June	.....	.....	.....	36	62	49.0	25	65	45.0	32	35	33.5	30	55	43.8
January–June	.....	.....	.....	36	62	49.0	25	65	42.3	32	45	39.4	30	55	44.7
July	.....	.....	.....	36	62	49.0	25	65	45.0	32	35	33.5	30	55	42.5
August	.....	.....	.....	28	62	47.3	21	65	44.3	25	35	30.8	20	55	38.2
September	.....	.....	.....	28	62	44.0	21	65	43.0	25	26	25.5	20	40	30.0
October	.....	.....	.....	28	60	39.8	21	65	43.4	20	35	24.1	20	40	25.8
November	.....	.....	.....	28	44	36.0	20	65	40.2	16	45	22.7	16	45	21.7
December	.....	.....	.....	28	44	37.3	18	65	41.8	16	45	30.5	16	45	31.9
July–December	.....	.....	.....	28	62	42.2	18	65	43.0	16	45	27.8	16	55	31.7

COFFEE.

TABLE 221.—*Coffee: International trade, calendar years 1909–1919.*[1]

[The item of coffee comprises unhulled and hulled, ground or otherwise prepared, but imitation or "surrogate" coffee and chicory are excluded. See "General note," Table 112.]

EXPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Belgium	33,627	....	....	....	....	....	14,979
Brazil	1,672,282	1,490,715	2,256,844	1,724,867	1,402,968	983,253	1,714,765
British India	27,780	39,973	22,441	17,868	27,632	14,868	36,792
Colombia	104,398	136,500	149,423	160,174	138,518	151,935	....
Costa Rica	27,515	39,059	26,918	37,137	27,048	25,265	30,784
Dutch East Indies	54,149	67,076	106,410	68,908	36,870	16,094	....
Guatemala	85,951	84,298	80,655	....	....	....	....
Haiti	61,943	....	....	....	....	....	....
Jamaica	8,263	8,932	7,126	7,387	5,759	....	....
Mexico	48,991	....	....	....	....	....	....
Netherlands	189,288	244,270	371,777	147,770	2,728	1	28,234
Nicaragua	19,033	22,817	20,134	23,044	....	....	....
Salvador	62,830	76,425	67,162	78,829	79,923	....	....
Singapore	4,700	3,256	....	....	....	....	....
United States[2]	44,251	48,179	47,327	38,279	48,592	44,727	34,352
Venezuela	111,326	121,350	137,967	112,024	97,236	88,155	....
Other countries	52,020	67,553	59,388	50,859	27,750	13,846	....
Total	2,608,347	2,450,403	3,353,571	2,467,146	1,895,023	1,338,144	....

IMPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	28,125	30,925	36,142	32,836	37,438	48,572	37,541
Austria-Hungary	128,304	....	....	....	....	....	....
Belgium	111,738	....	....	....	....	....	86,805
British South Africa	26,703	25,143	31,592	29,790	30,126	47,887	17,743
Cuba	24,906	17,672	21,215	19,427	27,642	26,050	....
Denmark	33,102	31,991	35,547	38,765	41,874	7,618	....
Egypt	15,654	13,116	18,701	16,640	15,843	15,693	16,039
Finland	28,624	22,438	28,820	15,388	....	....	....
France	245,752	256,658	305,409	337,215	360,873	299,052	457,450
Germany	399,965	....	....	....	....	....	....
Italy	58,278	62,176	88,119	107,948	98,830	113,848	80,405
Netherlands	283,633	275,466	441,402	196,027	33,927	7,973	120,606
Norway	29,309	26,231	53,219	53,211	32,973	18,028	....
Russia	26,073	18,309	21,012	9,801	....	....	....
Singapore	6,000	5,051	....	....	....	....	....
Spain	29,317	30,280	35,219	36,210	40,229	36,097	42,391
Sweden	74,486	64,724	88,698	84,568	18,893	24,719	86,037
Switzerland	25,029	23,864	29,092	43,883	21,193	22,534	22,534
United Kingdom	28,581	28,846	32,723	29,020	45,299	47,934	35,333
United States	907,899	1,011,072	1,228,762	1,166,888	1,286,524	1,052,202	1,333,564
Other countries	103,376	84,759	91,549	84,692	96,676	61,145	....
Total	2,614,854	2,028,721	2,587,220	2,302,310	2,188,339	1,829,351	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Chiefly from Porto Rico.

COFFEE—Continued.

TABLE 222.—*Coffee: Wholesale price per pound on the New York and New Orleans markets, 1913–1920.*

[Compiled from commercial papers.]

Date.	New York.																		New Orleans.					
	Rio No. 7.			Santos No. 7.			Mocha.			Padang.			Cucuta, washed.			Mexican, Cordova.			Rio No. 7.			Santos No 7.		
	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.	Low.	High.	Aver.
1913.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
January-June	9¼	14	......	10⅞	15⅝	......	18	21	......	19	22	......	12	17¾	......	15	18	......	9⅝	14	......	11⅛	15	......
July-December	8¾	11⅛	......	10⅜	13¼	......	18	20	......	21	23	......	11¾	17¾	......	15	16½	......	9	11½	......	10½	12⅞	......
1914.																								
January-June	8½	9⅝	......	10¼	11¾	......	17½	21	......	21	23	......	14¼	18	......	15¼	16½	......	8⅝	9¾	......	10½	11¾	......
July-December	6¼	9⅞	......	8¼	12¾	......	19½	30	......	21	24	......	11	18¼	......	12	17¼	......	6¾	10⅜	......	8¾	13½	......
1915.																								
January-June	7	8¼	......	8⅜	9¼	......	21½	30	......	21	23½	......	11¼	15¾	......	11	14½	......	7	8⅝	......	8¾	9⅝	......
July-December	6⅝	7¾	......	7¾	9	......	23	30	......	21	23	......	11	15¼	......	10½	13½	......	6⅞	8	......	7⅝	9	......
1916.																								
January-June	7⅝	9⅞	......	7⅞	9⅞	......	19	27	......	22½	26½	......	11½	16½	......	11½	14½	......	7⅝	10⅛	......	8⅛	10	......
July-December	9	10⅛	......	9½	11	......	18¾	20½	......	25	26½	......	12	14¾	......	11½	13½	......	8⅞	10½	......	9¼	10⅞	......
1917.																								
January-June	9⅜	10⅜	......	9½	10½	......	18¾	22	......	24	26	......	11¼	14⅞	......	11	14⅞	......	9⅜	10⅝	......	9½	10⅝	......
July-December	7¼	9½	......	8¾	9¾	......	19	22½	......	21	26	......	10¾	14	......	10¼	13	......	7⅞	9¾	......	9	10⅛	......
1918.																								
January-June	8	9¼	8.7	9⅛	10½	9.5	21½	26½	25.6	25	26	25.5	11	13¼	12.7	10¾	13¼	12.6	8½	9½	9.1	9⅞	11¼	10.8
July-December	8¾	17¼	10.9	10⅛	21	13.6	26½	37	32.1	25	29	26.1	12½	25	15.6	12¼	23½	15.1	9	11½	10.2	10¾	14¾	12.6
1919.																								
January-June	14½	25¼	17.4	19¾	26½	21.0	28	34	30.4	25½	29½	27.2	20	29½	23.4	20½	28	23.1	15½	25⅝	17.8	19½	28½	21.6
July-December	15	23¾	18.2	(1)	(1)	(1)	29	40	36.8	29	35½	30.8	24	29½	27.2	23½	31	27.9	15¼	25½	18.6	19	28¼	24.8
1920.																								
January	15¼	16⅞	16.2	(1)	(1)	(1)	33	36½	34.7	33	35½	33.9	25	27	26.2	26	28½	27.8	15⅞	17¼	16.7	22¼	23	22.5
February	14	15¾	14.6	(1)	(1)	(1)	33	36	34.5	33	34½	33.8	24	28	25.2	26	28½	27.0	15¼	16½	15.5	21¼	22¼	21.5
March	14⅜	15¼	15.1	18½	19¾	19.2	33	36	34.5	33	34½	33.8	23½	25	24.0	25½	27	26.3	15¼	16⅛	15.6	21½	22½	21.9
April	14¾	15½	15.1	18½	19	18.8	33	36	34.3	33	34½	33.8	23	25	24.2	25	26½	25.8	15⅜	16¼	15.8	21	21¾	21.4
May	15	15⅞	15.5	18½	19¼	18.8	33	35	34.0	33	34½	33.8	23	21	23.5	24	26	25.3	15⅝	16¼	16.0	21	21¾	21.4
June	14¼	15½	15.0	17½	19¼	19.1	33	35	34.0	33	34½	33.8	22	24	23.2	22	25	32.9	14	16⅝	15.4	19½	21½	20.9
January-June	14	16⅞	15.2	17½	19¾	19.0	33	36½	34.3	33	35½	33.8	22	28	24.4	22	28½	26.0	14	17¼	15.8	19½	23	21.6
July	10¾	14½	13.0	16¼	19¼	16.8	30	32	31.0	31	34½	31.9	18½	23	20.4	19	24	21.3	12	15¾	13.1	15½	18⅜	17.2
August	8¼	11	9.3	10½	12	11.2	28	32	29.2	25	32	28.0	15	19½	17.2	14	21	17.5	9½	11½	10.4	13¼	15½	14.0
September	7¾	8¾	8.2	9½	12	10.8	21	30	25.8	20	27	22.5	13	16	14.6	13	16	14.5	7⅞	9	8.3	10¾	12½	11.6
October	6⅜	8¼	7.6	8½	10¼	9.4	21	27½	22.8	20	29½	25.6	11½	14½	12.8	10¾	14½	12.9	6⅞	8⅞	7.7	9¼	11½	10.2
November	6⅜	8½	7.5	8½	9	9.0	21	21	22.5	21	24	22.6	12¼	13½	12.9	12	14	13.0	7⅛	8⅞	7.8	9	10¾	9.7
December	6¼	7¼	6.7	7½	9	8.6	19	29	23.3	22	28½	27.0	12	13	12.6	11½	13½	12.6	6½	7¾	7.5	8	9½	8.7
July-December	6¼	14½	8.7	7½	19¼	11.0	19	32	25.8	20	34½	26.3	11½	23	15.1	10¾	24	15.3	6½	15¾	9.1	8	18⅜	11.9

[1] No quotations.

OIL CAKE AND OIL-CAKE MEAL.

TABLE 223.—*Oil cake and oil-cake meal: International trade, calendar years 1909–1919.*

[The class called here "oil cake and oil-cake meal" includes the edible cake and meal remaining after making oil, from such products as cotton seed, flaxseed, peanuts, corn, etc. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909-1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Argentina	42,587	38,367	46,215	39,912	37,849	19,258	114,024
Austria-Hungary	124,873	....	....	....	....	....	....
Belgium	155,373	....	....	....	....	....	76,791
British India	268,648	334,141	335,901	292,904	204,267	191,307	305,134
Canada	51,370	30,567	32,730	31,707	18,309	2,456	41,222
China	147,468	183,581	164,212	113,330	149,186	167,277	....
Denmark	15,777	6,978	80	2	56	....	....
Egypt	161,624	176,339	246,183	185,731	181,434	11	146,042
France	476,863	396,644	244,888	248,495	12,076	5,323	19,310
Germany	525,108	....	....	....	....	....	....
Italy	55,115	120,695	12,660	32,453	22,885	11,129	34,468
Mexico	33,764	....	....	....	....	....	....
Netherlands	219,819	110,882	32,903	8,722	1,080	(2)	13,460
Russia	1,453,413	948,526	176,460	160,630	....	....	....
United Kingdom	161,798	73,295	25,829	3,857	188	157	11,422
United States	1,704,124	1,579,171	2,114,132	1,951,125	735,040	107,063	1,087,228
Other countries	83,814	67,011	70,305	64,389	56,613	24,579	....
Total	5,681,538	4,066,197	3,502,498	3,133,557	1,418,985	528,562	....

IMPORTS.

Country.	Average, 1909-1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	53,673	....	....	....	....	....	....
Belgium	543,648	....	....	....	....	....	39,209
Canada	7,752	15,625	22,215	14,731	23,476	44,249	12,312
Denmark	1,002,329	960,215	1,266,845	1,034,499	339,006	753	....
Dutch East Indies	2,509	1,560	1,221	201	1,279	1,646	....
Finland	25,333	23,698	88,810	127,177	....	....	....
France	288,968	160,299	8,344	3,381	6,352	33,821	15,604
Germany	1,686,416	....	....	....	....	....	....
Italy	10,550	2,471	5,998	885	28	4,393	99
Japan	189,868	256,968	197,822	144,847	186,382	185,118	....
Netherlands	707,116	564,275	598,236	461,385	181,217	213	223,859
Norway	55,112	83,716	71,160	74,964	69,521	48,432	....
Sweden	346,755	284,538	333,316	157,241	73,414	14,160	151,308
Switzerland	69,352	38,818	38,226	58,447	62,476	24,808	91,795
United Kingdom	790,865	731,264	936,681	636,126	476,847	24,232	623,334
Other countries	31,756	22,748	22,762	55,326	54,964	64,938	....
Total	5,812,002	3,146,195	3,591,636	2,769,210	1,474,962	446,763	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 pounds.

ROSIN.

TABLE 224.—*Rosin: International trade, calendar years, 1909–1919.*[1]

[For rosin, only the resinous substance known as "rosin" in the exports of the United States is taken See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Austria-Hungary	2,205	....	....	....	....	....	....
Belgium	32,830	....	....	....	....	....	9,126
France	118,286	95,397	111,547	67,470	56,496	41,049	114,200
Germany	50,110	....	....	....	....	....	....
Greece	10,423	9,174	7,308	8,597	6,194	....	....
Netherlands	59,366	62,583	4,324	345	1	(²)	259
Spain	20,073	19,148	29,366	23,663	23,006	11,787	28,748
United States	655,520	489,580	387,418	515,856	418,150	218,128	338,696
Other countries	1,568	5,903	8,602	6,913	7,572	10,779	....
Total	950,381	681,785	548,565	622,844	511,419	281,743	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	32,719	35,463	45,487	35,998	44,105	31,106	34,965
Australia	13,724	8,450	20,709	10,658	17,951	11,453	....
Austria-Hungary	75,705	....	....	....	....	....	....
Belgium	47,163	....	....	....	....	....	32,107
Brazil	36,905	29,340	40,682	40,714	36,196	25,470	37,945
British India	6,171	3,535	3,914	1,233	4,403	3,539	2,582
Canada	25,506	22,883	27,314	28,882	33,873	34,255	23,142
Chile	7,410	4,515	4,200	2,167	4,136	2,703	....
Cuba	4,123	4,239	5,391	7,958	7,851	6,831	....
Denmark	3,236	3,178	5,052	4,683	1,605	764	....
Dutch East Indies	15,039	15,448	15,247	13,787	10,179	12,944	....
Finland	6,027	4,923	5,103	9,630	....	....	....
France	2,432	1,181	534	665	504	1,158	1,795
Germany	233,100	....	....	....	....	....	....
Italy	34,171	32,978	54,541	43,915	45,482	23,266	33,912
Japan	10,073	10,669	17,809	30,182	26,083	26,142	....
Netherlands	73,991	77,809	18,471	9,435	1,563	207	8,303
Norway	6,732	6,602	13,395	11,074	2,054	3,959	....
Roumania	5,004	....	....	....	....	....	2,976
Russia	68,429	64,030	23,628	58,109	....	....	....
Serbia	1,162	....	....	....	....	....	....
Spain	1,827	645	422	375	198	198	203
Switzerland	4,983	4,236	7,723	7,852	5,581	9,108	3,197
United Kingdom	166,075	154,655	176,360	184,985	188,881	84,193	196,131
Other countries	18,734	9,082	21,770	25,134	13,662	8,930	....
Total	900,441	493,861	507,752	527,486	444,307	286,226	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 pounds.

TURPENTINE.

TABLE 225.—*Turpentine (spirits): International trade, calendar years 1909–1919.*[1]

["Spirits of turpentine" includes only "spirits" or "oil" of turpentine and for Russia skipidar: it excludes crude turpentine, pitch, and for Russia turpentine. See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*	*1,000 gallons.*
Belgium	1,144	....	....	....	....	....	315
France	2,594	1,703	1,246	842	381	6,189	2,078
Germany	460	....	....	....	....	....	....
Netherlands	2,750	2,883	38	20	2	(2)	50
Russia	2,322	1,337	95	5	....	....	....
Spain	1,156	1,052	922	1,144	1,260	710	1,360
United States	17,868	11,118	10,619	9,544	6,517	3,717	10,672
Other countries	649	293	581	418	267	11	....
Total	28,943	18,386	13,501	11,973	8,427	10,627	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	554	488	524	500	576	254	480
Australia	564	471	791	677	634	600	....
Austria-Hungary	2,581	....	....	....	....	....	....
Belgium	1,932	....	....	....	....	....	1,088
Canada	1,175	1,152	1,113	1,135	1,247	1,209	1,139
Chile	198	140	114	(2)	(2)	175	....
Germany	9,368	....	....	....	....	....	....
Italy	940	874	968	754	702	673	1,198
Netherlands	3,998	3,632	1,155	728	346	21	971
New Zealand	178	81	130	158	91	95	....
Russia	273	243	192	160	....	....	....
Sweden	134	110	110	99	4	(2)	115
Switzerland	466	375	395	455	376	439	473
United Kingdom	7,782	5,031	7,446	5,937	3,097	960	6,642
Other countries	1,057	983	1,144	1,439	1,397	787	....
Total	31,200	13,580	14,082	12,042	8,470	5,213	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 gallons.

INDIA RUBBER.[1]

TABLE 226.—*India rubber: International trade, calendar years 1909-1919.*[1]

[Figures for india rubber include "india rubber," so called, and caoutchouc, caucho, jebe (Peru), hule (Mexico), borracha, massaranduba, manabeira, manicoba, sorva, and seringa (Brazil), gomelastiek (Dutch East Indies), caura, ser nambi (Venezuela). See "General note," Table 112.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Angola	5,620	4,066					
Belgian Kongo	7,755						
Belgium	20,749						3,461
Bolivia	8,395	13,415	11,144				
Brazil	84,938	73,924	77,525	69,433	74,952	49,960	73,306
Ceylon	10,953	37,344	48,804	54,509	75,781	50,935	
Dutch East Indies	7,679	22,570	43,846	74,106	100,779	97,192	
Ecuador	1,040	325	561	837	910		
France	21,615	12,635	4,530	5,594	6,634	6,046	21,849
French Guinea	3,937	2,037					
French Kongo	3,797	1,328					
Germany	9,844						
Gold Coast	2,393	654	648	2,216	2,961	1,391	
Ivory Coast	2,740	301					
Kamerun	6,409						
Mexico	14,262						
Netherlands	7,172	11,665	414	275	33	11	7,793
Peru	5,030	5,009	7,498	6,197	7,263	3,828	7,126
Senegal	1,087	4	107	163			
Singapore	5,843	28,474					
Nigeria	3,054	373	556	886	878	353	
Negri Sembilan	3,995	11,881	18,316				
Perak	7,313	24,732	37,325				
Selangor	13,736	32,041	43,053				
Venezuela	772	252	310	309	404	81	
Other countries	28,936	26,603	15,737	11,320	22,645	11,158	
Total	289,064	309,633	310,374	225,845	293,240	220,955	

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	6,696						
Belgium	25,891						12,384
Canada	3,945	5,108	9,731	9,868	13,641	18,216	19,645
France	32,704	22,439	25,799	34,229	43,848	41,792	67,676
Germany	42,004						
Italy	5,381	6,733	11,833	11,728	13,508	16,635	23,211
Netherlands	10,822	15,695	6,909	737	5	3	14,001
Russia	19,131	25,086	29,761	17,804			
United Kingdom	43,141	41,597	33,760	59,941	58,122	67,298	95,245
United States	100,180	143,065	221,482	270,090	405,638	325,959	535,940
Other countries	12,424	31,278	15,521	21,191	15,007	26,457	
Total	302,319	291,001	354,796	425,588	549,769	496,360	

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

SILK.

TABLE 227.—*Production of raw silk in undermentioned countries, 1909–1919.*

[Estimates of the Silk Merchants' Union, Lyon, France.]

Country.	Average, 1909–1913.	1916	1917	1918	1919
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Western Europe:					
Italy	8,524,000	7,963,000	6,217,000	5,942,000	4,079,000
France	992,000	485,000	452,000	529,000	408,000
Spain	182,000	198,000	154,000	165,000	154,000
Austria }	726,000	187,000	188,000	187,000	165,000
Hungary }		143,000	143,000	143,000	110,000
Total	10,424,000	8,976,000	7,154,000	6,966,000	4,916,000
Levant and Central Asia:					
Broussa and Anatolia	1,137,000	386,000	....	....	....
Syria and Cyprus	1,058,000	772,000	....	....	....
Other Provinces of Asiatic Turkey	294,000	143,000	....	....	....
Turkey in Europe [1]	[2] 187,000	66,000	....	....	....
Saloniki and Adrianople	[3] 758,000	....	....	....	....
Balkan States (Bulgaria, Serbia, and Roumania	374,000	220,000	....	....	....
Greece, Saloniki,[1] and Crete	182,000	243,000	....	....	....
Caucasus	1,023,000	276,000	....	....	....
Persia (exports) }	1,173,000	77,000	....	....	....
Turkestan (exports)[4] }		110,000	....	....	....
Total	6,186,000	2,293,000	2,293,000	2,293,000	1,764,000
Far East:					
China—					
Exports from Shanghai	12,576,000	10,340,000	10,097,000	10,739,000	8,598,000
Exports from Canton	5,146,000	5,346,000	5,170,000	3,638,000	5,071,000
Japan—					
Exports from Yokohama	21,898,000	29,431,000	34,050,000	32,309,000	32,188,000
British India—					
Exports from Bengal and Cashmere	428,000	254,000	232,000	242,000	220,000
Indo-China—					
Exports from Saigon, Haiphong, etc	[5] 31,000	7,000	11,000	11,000	11,000
Total	40,079,000	45,378,000	49,560,000	46,939,000	46,088,000
Grand total	56,689,000	56,647,000	59,007,000	56,198,000	52,768,000

[1] Prior to 1913 Turkey in Europe included the vilayet of Saloniki, which belonged to Greece in subsequent years.
[2] For 1913 only.
[3] For four years, 1909–1912.
[4] Including "Central Asia" subsequent to 1911.
[5] For three years, 1911–1913.

WOOD PULP.

TABLE 228.—*Wood pulp: International trade, calendar years 1909–1919.*[1]

[All kinds of pulp from wood have been taken for this item, but no pulp made from other fibrous substances. See "General note," Table 112.]

EXPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Austria-Hungary	205,364	....	....	....	....	....	....
Belgium	80,647	....	....	....	....	....	3,169
Canada	606,203	849,766	728,341	1,117,796	1,023,607	1,167,822	1,418,259
Finland	236,881	213,843	221,420	223,139	....	....	....
Germany	384,709	....	....	....	....	....	....
Norway	1,437,078	1,407,299	1,618,363	1,522,991	890,991	1,065,837	....
Russia	52,735	6,515	14	....	....	....	....
Sweden	1,822,023	2,054,813	2,185,483	2,224,800	1,534,285	1,589,576	1,989,645
Switzerland	13,072	15,573	22,877	14,671	7,056	4,313	20,570
United States	24,309	24,674	40,589	80,046	78,360	44,648	80,114
Other countries	75,486	112,315	52,697	315	27,066	56	....
Total	4,938,507	4,684,798	4,869,784	5,183,759	3,561,366	3,872,252	....

IMPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Argentina	52,016	51,441	33,679	49,128	29,636	37,293	42,856
Austria-Hungary	13,366	....	....	....	....	....	....
Belgium	291,254	....	....	....	....	....	121,207
Denmark	110,866	132,929	125,240	169,589	120,555	132,932	....
France	836,899	702,639	623,620	799,633	353,417	558,987	590,549
Germany	112,660	....	....	....	....	....	....
Italy	179,267	193,943	135,084	144,333	43,320	39,531	87,257
Japan	79,260	100,764	119,307	128,271	31,854	63,934	....
Portugal	18,662	17,129	16,942	16,026	5,651	....	....
Russia	56,072	62,880	176,830	234,553	....	....	....
Spain	92,770	87,233	114,325	151,124	73,712	71,462	84,830
Sweden	9,515	10,616	19,043	8,098	2,752	6,521	....
Switzerland	21,059	16,115	21,839	25,704	23,459	35,348	29,272
United Kingdom	1,891,006	2,201,302	2,131,945	1,474,054	866,784	939,337	2,100,911
United States	1,007,239	1,351,130	1,145,717	1,367,529	1,355,682	1,156,418	1,272,033
Other countries	85,052	207,956	170,162	267,014	262,511	388,834	....
Total	4,856,963	5,136,077	4,833,732	4,835,056	3,169,332	3,430,597	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

LIVE STOCK, 1920.

FARM ANIMALS AND THEIR PRODUCTS.

LIVE STOCK, ALL CLASSES.

TABLE 229.—*Live stock in principal and other countries.*

[Census returns are in *italics*; other figures are in roman type.]

PRINCIPAL COUNTRIES.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
United States:									
On farms	Jan. 1, 1921	66,191	....	66,649	45,067	....	20,183	4,999	....
	Jan. 1, 1920	68,369	....	71,727	47,114	....	20,785	5,041	....
	Jan. 1, 1919	68,560	....	74,584	48,866	....	21,482	4,954	....
	Jan. 1, 1918	67,422	....	70,978	48,603	....	21,555	4,873	....
	Jan. 1, 1917	63,617	....	67,453	48,483	....	21,126	4,639	....
	Jan. 1, 1916	61,920	....	67,766	48,625	....	21,159	4,593	....
	Jan. 1, 1915	58,329	....	64,618	49,956	....	21,195	4,479	....
	Jan. 1, 1914	56,592	....	58,933	49,719	....	20,962	4,449	....
	Jan. 1, 1913	56,527	....	61,178	51,482	....	20,567	4,386	....
	Jan. 1, 1912	57,959	....	65,410	52,362	....	20,509	4,362	....
	Jan. 1, 1911	60,502	....	65,620	53,633	....	20,277	4,323	....
	Apr. 15, 1910	*61,804*	....	*58,186*	*52,448*	*2,915*	*19,833*	*4,210*	*106*
Not on farms	....do....	*1,879*	....	*1,288*	*391*	*115*	*3,188*	*270*	*17*
Alaska (on farms and and not on farms)	*Jan. 1, 1910*	*1*	[1] *22*	([2])	([2])	([2])	([2])	([2])	([2])
Hawaii (on farms and not on farms)	*Apr. 15, 1910*	*149*	....	*31*	*77*	*5*	*28*	*9*	*3*
Porto Rico (on farms and not on farms)	....do....	*316*	....	*106*	*6*	*49*	*58*	*5*	*1*
Virgin Islands:									
On farms	*Nov. 1, 1917*	*12*	....	*2*	*1*	*2*	*2*	*2*	*1*
Not on farms	....do....	....	([2])	([2])	([2])	([2])	([2])	([2])	([2])
Algeria	Sept. —, 1914	1,093	....	108	9,140	3,794	203	185	268
	Sept. —, 1913	1,108	....	112	8,811	3,848	216	192	272
	Sept. —, 1912	1,107	....	114	8,338	3,772	221	192	271
	Sept. —, 1911	1,114	....	110	8,529	3,862	227	192	279
	Sept. —, 1910	1,128	....	109	9,042	3,990	230	192	276
	Sept. —, 1909	1,101	....	111	9,067	4,007	233	187	278
	Sept. —, 1908	1,092	....	103	9,632	4,199	236	188	272
	Sept. —, 1907	1,082	....	98	9,335	4,253	221	174	266
	Sept. —, 1906	1,078	....	96	8,800	3,960	226	172	275
	Sept. —, 1905	1,067	....	91	9,063	4,030	221	174	278
	Sept. —, 1900	993	....	82	6,724	3,563	202	147	263
	Sept. —, 1895	1,121	....	84	7,892	3,545	217	142	287
Argentina	Dec. 31, 1918	27,392	....	3,227	45,309	4,670	9,061	601	....
	Dec. 31, 1915	26,388	....	....	43,677	....	....	....	....
	Dec. 31, 1914	*25,867*	....	*2,901*	*43,225*	*4,325*	*8,324*	*565*	*260*
	Dec. 31, 1913	30,796	....	3,197	81,485	4,564	9,366	584	345
	Dec. 31, 1912	28,981	....	3,045	76,279	4,431	9,239	556	329
	Dec. 31, 1911	28,786	....	2,900	80,401	4,302	8,894	535	319
	Dec. 31, 1910	28,828	....	....	73,013	....	....	....	....
	Dec. 31, 1909	27,825	....	....	65,082	....	....	....	....
	1908	*29,124*	....	*1,404*	*67,384*	*3,947*	*7,537*	*465*	*285*
	1895	*21,702*	....	*653*	*74,380*	*2,749*	*4,447*	*285*	*198*
Australia	June 30, 1920	....	....	....	[3] 78,000	....	....	....	....
	1919	11,040	....	[4] 1,111	[3] 88,000	....	....	....	....
	Dec. 31, 1918	12,739	....	914	87,086	....	2,528	....	....
	Dec. 31, 1917	11,829	....	1,169	81,965	....	2,499	....	....
	Dec. 31, 1916	10,459	....	1,007	76,669	....	2,437	....	....
	Dec. 31, 1915	9,931	....	754	69,257	....	2,378	....	....
	Dec. 31, 1914	11,052	....	862	78,600	....	2,521	....	....
	Dec. 31, 1913	11,484	....	801	85,057	262	2,523	....	....
	Dec. 31, 1912	11,577	....	845	83,251	....	2,408	....	....
	Dec. 31, 1911	11,829	....	1,111	93,004	....	2,279	....	....
	Dec. 31, 1910	11,745	....	1,026	92,047	314	2,166	....	....
	Dec. 31, 1909	11,040	....	765	91,676	....	2,023	....	....
	Dec. 31, 1908	10,548	....	696	87,043	....	1,928	....	....
	1907	10,128	....	754	87,650	....	1,872	....	....
	1906	9,349	....	814	83,688	....	1,765	....	....
	1905	8,528	....	1,015	74,541	....	1,675	....	....
	1904	7,841	....	1,063	65,824	....	1,595	....	....
	1903	7,248	....	837	56,933	....	1,546	....	....

[1] Reindeer. [2] Less than 500. [3] Unofficial estimate. [4] Excluding northern territory.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Australia (continued)	1902	7,063		777	53,668		1,525		
	1901	8,471		947	72,209		1,625		
	Dec. 31, 1900	8,640		950	70,603		1,610		
	Dec. 31, 1895	11,767		823	90,690		1,680		
	1890	10,300		891	97,881		1,522		
Austria [5]	*Dec. 31, 1910*	*1,159*	*1*	*6,432*	*2,428*	*1,257*	*1,803*	*21*	*53*
	Dec. 31, 1900	*9,511*		*4,683*	*2,621*	*1,020*	*1,716*	*20*	*46*
	Dec. 31, 1890	*8,644*		*3,550*	*3,187*	*1,036*	*1,543*	*17*	*41*
	Dec. 31, 1880	*8,584*		*2,722*	*3,841*	*1,007*	*1,463*	*50*	
Bahamas	1917	1			16		1		
	1916	2			14		1		
	1915	2			12		1		
	1914	2			13		1		
	1913	2			12		1		
	1912	2			11	4	1		
	1911	2			10	4	1		
	1910	1			9	4	1		
	1909	2			13	5	1		
Barbados	1917						2		
	1916						2		
	1915						2		
	1914						2		
	1913						2		
	1912						3	4	5
	1911						3	4	5
	1910						2	4	4
	1909						2	4	4
	1908						2	4	4
	1907						2	4	4
	1906						2	4	4
	1905						2		
	1904						2		
	1903						2		
	1902						2		
	1901						3		
	1900						3		
Basutoland	*1911*	*437*			*1,369*		*88*		
	1904	*213*		(2)	[6] *3*		*65*		
Bechuanaland Protectorate	*1911*	*324*			*358*		*2*		
	1904	139					1		
Belgium	1920	1,292		546	126	33		198	
	Oct. —, 1919	[7] 1,152		328	112	37		174	
	Dec. 31, 1913	1,849		1,412			267		
	Dec. 31, 1912	1,831		1,349			263		
	Dec. 31, 1911	1,812		1,229			261		
	Dec. 31, 1910	*1,880*		*1,494*	*185*	*218*	*317*	*3*	*8*
	Dec. 31, 1909	1,857		1,117			255		
	Dec. 31, 1908	1,861		1,162			253		
	Dec. 31, 1907	1,813		1,279			250		
	Dec. 31, 1906	1,780		1,148			245		
	Dec. 31, 1905	1,788		1,047			245		
	Dec. 31, 1904	1,782		1,155			246		
	Dec. 31, 1903	1,720		1,183			219		
	Dec. 31, 1901	1,646		1,015			245		
	1895	*1,421*		*1,163*	*236*	*241*	*272*	*7*	
	1880	*1,383*		*646*	*365*		*272*		
	1866	*1,242*		*632*	*586*		*283*		
	1856	*1,258*		*458*	*583*		*277*		
Bermuda	1915						1		
	1914						1		
	1913						1		
	1912						1		
	1911	*1*					*1*		
	1907	2						1	
	1906							1	
	1905							1	
	1904							1	

[2] Less than 500. [5] Old boundaries. [6] Owned by Europeans only. [7] Milk cows only.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Bosnia-Herzegovina [5].	*Oct. 10 / Nov. 10, 1910*	*1,309*	*1*	*527*	*2,499*	*1,393*	*222*	(2)	*6*
	Apr. 22 / May 22, 1895	*1,416*	*1*	*662*	*3,231*	*1,447*	*231*	*1*	*5*
Brazil	Dec. —, 1918	[3] 37,500	....	....	....	....	....	....	....
	1916	28,962		17,329	7,205	6,920	6,065	3,222	
	1912–13	*30,705*		*18,399*	*10,653*	*10,049*	*7,289*	*3,208*	
British Guiana	June 30, 1918	77	(2)	13	21	11	1	2	5
	1917	[8] 99	(2)	12	22	14	1	2	7
	1916	93	(2)	12	23	15	1	2	6
	1915	98	(2)	14	22	15	1	2	6
	1914	90	(2)	11	20	15	1	2	6
	1913	81	(2)	14	18	14	1	2	6
	1912	72	....	17	18	....	2		....
	1911	81	....	17	19	....	3		....
	1910	72	....	17	18	....	2		....
	1909	72	....	13	17	....	2		....
	1908	70	....	13	18	....	2		....
	1907	72	....	13	17	....	2		....
	1906	85	....	16	14	....	2		....
	1905	77	....	13	18	....	2		....
	1904	86	....	12	17	....	1	....	....
	1903	70	....	12	12	....	1	....	....
Bulgaria [11]	1912	852	163	....	....	....	219	....	....
	1911	866	167	....	....	....	226	....	....
	Dec. 31, 1910	*1,603*	*415*	*527*	*8,632*	*1,459*	*478*	*12*	*117*
	1909	889	189	....	....	....	230	....	....
	1908	902	196	....	....	....	238	....	....
	1907	912	206	....	....	....	250	....	....
	1906	919	204	....	....	....	253	....	....
	Dec. 31, 1905	*1,696*	*477*	*465*	*8,131*	*1,384*	*538*	*12*	*128*
	1904	903	199	....	....	....	442	....	....
	Dec. 31, 1900	*1,596*	*431*	*368*	*7,015*	*1,405*	*495*	*9*	*104*
	Dec. 31, 1892	*1,426*	*342*	*462*	*6,868*	*1,264*	*344*	*8*	*82*
Cape Verde Islands	1916	9	....	17	6	38	1	1	17
	1915	8	....	14	5	32	1	1	10
	1914	8	....	14	4	30	1	1	10
Canada	June —, 1920	9,477	....	3,517	3,721	....	3,401	9,055	....
	June —, 1919	10,084	....	4,040	3,422	....	3,667	15,102	....
	June 30, 1918	10,056	....	4,290	3,053	....	3,609	....	....
	June 30, 1917	7,921	....	3,619	2,369	....	3,413	....	....
	June 30, 1916	6,594	....	3,475	2,023	....	3,258	....	....
	June 30, 1915	6,066	....	3,112	2,039	....	2,996	....	....
	June 30, 1914	6,037	....	3,434	2,058	....	2,948	....	....
	June 30, 1913	6,656	....	3,448	2,129	....	2,866	....	....
	June 30, 1912	6,432	....	3,477	2,082	....	2,692	....	....
	June 1, 1911	*6,533*	....	*3,610*	*2,175*	....	*2,596*	....	....
	June 30, 1910	7,115	....	2,754	2,598	....	2,213	....	....
	June 30, 1909	7,234	....	2,913	2,705	....	2,132	....	....
	June 30, 1908	7,548	....	3,370	2,831	....	2,118	....	....
	June 30, 1907	7,132	....	3,445	2,783	....	1,923	....	....
	June 30, 1901	*5,576*	....	*2,354*	*2,510*	....	*1,577*	....	....
	1891	4,121	....	1,734	2,564	....	1,471	....	....
	1881	3,515	....	1,208	3,049	....	1,059	....	....
Ceylon	1918	1,451	....	69	64	187	3	....	....
	1917	1,577	....	86	63	193	4	....	....
	1916	1,518	....	61	85	186	4	....	....
	1915	1,501		71	90	....	4	....	....
	1914	1,484		84	64	....	4	....	....
	1913	1,484		86	90	....	5	....	....
	Dec. 31, 1912	1,505		85	91	209	5	....	....
	Dec. 31, 1911	1,465		87	90	195	5	....	....
	1909	1,510		97	96	171	4	....	....
	1908	1,635		93	101	174	4	....	....
	1907	1,559		96	99	....	4	....	....
	1906	1,543		99	95	....	4	....	....

[2] Less than 500.
[3] Unofficial estimate.
[5] Old boundaries.
[8] Not including cattle of interior prairies, estimated at 24,000 head.
[11] All figures except for census years are for farm animals only.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Ceylon (continued)	1905	1,490		98	96	....	4	....	....
	1904	1,534		94	88	....	4	....	....
	1903	1,422		92	90	....	7	....	....
	1902	1,348		92	87	....	4	....	....
	1901	1,477		88	91	....	4	....	....
	1900	1,398		91	90	....	5	....	....
Costa Rica	1915	333	....	63	(2)	(2)	52	....	....
	1914	*336*	....	*64*	(2)	*1*	*52*	*2*	(2)
	1910	*333*	....	*70*	*1*	*1*	*60*	*3*	(2)
	1905	*308*	....	*78*	(2)	*1*	*52*	*3*	(2)
Chile	1918	2,225	....	326	4,434	452	411	53	38
	1917	2,030	....	301	4,183	376	403	52	36
	1916	1,869	....	260	4,569	386	443	39	36
	1915	1,944	....	229	4,545	394	458	42	37
	1914	1,969	....	221	4,602	299	458	38	33
	1913	2,084	....	184	4,567	288	489	34	30
	1912	1,760	....	166	4,169	273	421	37	33
	1911	1,640	....	160	3,538	210	352	30	33
	1910	1,635	....	178	1,636	205	347	30	27
	1908	2,304	....	216	4,224	344	517	43	40
Croatia-Slavonia [5]	*Mar. 24, 1911*	*1,185*		*1,164*	*850*	*96*	*350*	*3*	
	Dec. 31, 1895	*909*		*883*	*596*	*22*	*311*	*1*	*2*
Cuba	Dec. 31, 1916	3,962	....	....	....	....	750	58	3
	Dec. 31, 1915	3,704	....	....	....	....	720	54	3
	Dec. 31, 1914	3,395	....	....	....	....	673	50	3
	Dec. 31, 1913	3,141	....	....	....	....	625	46	2
	Dec. 31, 1912	2,830	....	....	....	....	561	41	2
	Dec. 31, 1911	2,329	....	....	....	....	457	31	2
	Dec. 31, 1910	3,212	....	....	....	....	613	61	3
	Dec. 31, 1909	3,075	....	....	....	....	555	59	3
	Dec. 31, 1908	2,892	....	....	....	....	492	55	3
	Dec. 31, 1907	2,728	....	....	....	....	443	53	3
Cyprus [9]	Mar. 31, 1918	49	....	....	253	....	57		
	Mar. 31, 1917	53	....	....	250	....	63		
	Mar. 31, 1916	63	....	35	282	....	70		
	Mar. 31, 1915	61	....	39	282	....	66		
	Mar. 31, 1914	61	....	37	269	....	67		
	Mar. 31, 1913	61	....	40	256	....	69		
	Mar. 31, 1912	60	....	36	260	....	70		
	Mar. 31, 1911	62	....	35	294	....	69		
	Mar. 31, 1910	63	....	32	315	....	68		
	Mar. 31, 1909	56	....	34	285	....	67		
	Mar. 31, 1908	58	....	36	278	....	63		
	Mar. 31, 1907	55	....	46	259	....	60		
	Mar. 31, 1906	53	....	45	253	....	59		
	Mar. 31, 1905	50	....	37	236	....	56		
	Mar. 31, 1904	49	....	30	230	....	56		
	Mar. 31, 1903	45	....	36	236	....	55		
	Mar. 31, 1902	51	....	39	288	....	64		
	Mar. 31, 1901	49	....	35	313	....	63		
	Mar. 31, 1900	47	....	26	287	....	60		
Czecho-Slovakia [10]	1919	3,256	....	1,384	706	952	481	(2)	(2)
Cayman Islands (British).	1918	1	....	1	....	(2)	(2)	....	....
	1917	2	....	1	....	(2)	(2)	....	....
	1916	2	....	1	....	(2)	(2)	....	....
	1915	2	....	1	....	(2)	(2)	....	....
	1914	2	....	1	....	(2)	(2)	....	....
	1913	2	....	1	....	(2)	(2)	....	....
Denmark	July 15, 1920	2,286	....	1,008	504	45	563	....	....
	July 15, 1919	2,188	....	716	509	45	558	....	....
	July 15, 1918	2,124	....	621	470	41	545	....	....
	July 2, 1917	2,458	....	1,651	480	31	575	....	....
	Feb. 29, 1916	*2,290*	....	*1,983*	*255*	....	*516*	....	....
	May 15, 1915	*2,417*	....	*1,919*	*533*	....	*526*	....	....
	July 15, 1914	*2,463*	....	*2,497*	*515*	*41*	*567*	....	....
	July 15, 1909	*2,254*	....	*1,468*	*727*	*40*	*535*	....	....
	July 15, 1903	*1,840*	....	*1,457*	*877*	*39*	*487*	....	....
	July 15, 1898	*1,745*	....	*1,168*	*1,074*	*32*	*449*	....	....

[2] Less than 500.
[5] Old boundaries.
[9] Sheep figures are for those of 1 year of age and over.
[10] Excludes Ruthenia.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Dutch East Indies:									
Java and Madura	*1915*	*3,248*	*2,541*	....	....	....	*304*	......	......
	1905	*2,654*	*2,187*	....	....	....	*334*	......	......
	1900	*2,655*	*2,436*	....	....	....	*418*	....	....
	1895	2,572	2,643	....	....	....	483	....	....
	1890	2,353	2,634	....	....	....	535	....	....
	1885	2,046	2,481	....	....	....	518	....	....
	1880	1,825	2,399	....	....	....	538	....	....
Other possessions	*1915*	*712*	....	....	....	....	*323*	....	....
	1905	*447*	....	....	....	....	*119*	....	....
Dutch West Indies:									
Curacao and dependencies	1917	4	....	4	22	69	1	(²)	5
	1916	4	....	4	18	61	1	(²)	4
	1915	3	....	3	12	55	1	(²)	4
	1914	3	....	3	11	45	1	(²)	4
	1913	3	....	4	12	46	1	(²)	4
	1912	3	....	4	10	35	1	(²)	4
	1911	4	....	7	22	53	1	(²)	5
	1910	4	....	6	24	59	1	(²)	7
	1909	4	....	6	23	60	1	(²)	6
	1908	3	....	5	20	51	1	(²)	6
Surinam	1917	10	....	2	(²)	2	(²)	(²)	1
	1916	10	....	2	(²)	3	(²)	(²)	1
	1915	9	....	2	(²)	3	(²)	(²)	1
	1914	8	....	4	(²)	3	(²)	(²)	1
	1913	8	....	5	(²)	3	(²)	(²)	1
	1912	7	....	4	(²)	3	(²)	(²)	1
	1911	7	....	3	(²)	3	(²)	(²)	(²)
	1910	7	....	3	(²)	3	(²)	(²)	1
	1909	7	....	3	(²)	3	(²)	(²)	(²)
	1908	7	....	3	(²)	2	(²)	(²)	1
East Africa Protectorate (British)	Mar. 31, 1917	1,943	....	....	....	....	....	....	....
	Mar. 31, 1916	1,000	....	6	6,565	....	2	....	....
	Mar. 31, 1915	900	....	4	6,555	....	2	....	....
	Mar. 31, 1914	800	....	4	6,550	....	2	....	....
	Mar. 31, 1913	780	....	3	6,500	....	1	....	....
	Mar. 31, 1912	775	....	3	6,500	....	1	....	....
	Mar. 31, 1911	750	....	3	5,500	....	1	....	....
	Mar. 31, 1910	750	....	2	5,105	....	(²)	....	....
	Mar. 31, 1909	714	....	2	3,740	....	(²)	....	....
	Mar. 31, 1908	....	....	....	....	....	(²)	....	....
	Mar. 31, 1906	297	....	....	2,101	....	(²)	....	....
	Mar. 31, 1905	297	....	....	2,100	....	(²)	....	....
	Mar. 31, 1904	275	....	....	2,300	....	(²)	....	....
	Mar. 31, 1903	251	....	....	2,250	....	(²)	....	....
Egypt	1919	499	540	....	754	286	31	22	....
	1918	517	571	19	854	231	30	15	583
	1917	515	566	13	808	263	31	17	586
	1916	493	515	9	688	308	34	17	526
	1915	551	538	7	755	290	35	22	547
	1914	601	568	....	816	331	40	22	632
	1913	637	633	....	....	....	48	23	682
	1912	620	652	....	....	....	47	21	691
	1911	656	657	....	....	....	51	25	654
	1910	672	675	....	....	....	52	39	691
	1909	725	....	....	....	....	....	....	....
	1908	738	....	....	....	....	....	....	....
	1907	779	....	....	....	....	....	....	....
	1906	733	....	....	....	....	....	....	....
	1905	655	....	....	....	....	....	....	....
	1904	605	....	....	....	....	....	....	....
	1903	960	....	....	....	....	....	....	....
Falkland Islands (British)	1917	7	....	(²)	697	....	3	....	....
	1916	6	....	(²)	690	....	4	....	....
	1915	8	....	(²)	701	....	4	....	....
	1914	8	....	(²)	698	....	4	....	....
	1913	8	....	(²)	698	....	4	....	....
	1912	8	....	(²)	711	....	4	....	....
	1911	8	....	(²)	706	....	4	....	....
	1910	5	....	(²)	725	....	3	....	....

² Less than 500.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Falkland Islands (British) (contd.)..	1909	5	....	(2)	716	....	3	....	....
	1908	5	....	(2)	689	....	3	....	....
	1907	4	....	(2)	696	....	3	....	....
	1906	4	....	(2)	703	....	3	....	....
	1905	4	....	(2)	701	....	3	....	....
	1904	4	....	(2)	702	....	3	....	....
	1903	4	....	(2)	681	....	3	....	....
	1902	4	....	(2)	714	....	3	....	....
	1901	5	....	(2)	762	....	3	....	....
	1900	7	....	(2)	778	....	4	....	....
Faroe Islands (Denmark)................	1914	4	....	(2)	112	(2)	1	....	....
	1909	4	....	(2)	100	(2)	1	....	....
	1903	4	....	(2)	91	(2)	1	....	....
	1898	5	....	(2)	106	(2)	1	....	....
	1893	4	....	(2)	100	(2)	1	....	....
Fiji Islands (British)[6]	1917	48	....	....	1	....		7	
	1916	50	....	....	1	....		7	
	1915	59	....	2	2	....		7	
	1914	53	....	2	3	....		7	
	1913	49	....	2	3	....		7	
	1912	45	....	2	4	....		6	
	1911	45	....	3	5	....		6	
	1910	40	....	3	6	....		6	
	1909	34	....	....	7	....		5	
	1908	36	....	4	3	....		5	
	1907	30	....	4	1	....		5	
	1906	35	....	4	2	....		5	
	1905	29	....	3	1	....	4	....	....
	1904	22	....	2	1	....	3	....	....
	1903	19	....	2	1	....	3	....	....
	1902	20	....	2	1	....	3	....	....
	1901	24	....	2	1	....	2	....	....
	1900	17	....	2	1	....	2	....	....
Finland................	May 30, 1918	1,400	....	....	....	....	309	....	....
	1916	[12] 1,111	....	....	....	....	[13] 276	....	....
	1915	[12] 1,150	....	....	....	....	[13] 288	....	....
	1914	[12] 1,167	....	....	....	....	[13] 294	....	....
	1913	[12] 1,178	....	....	....	....	[13] 297	....	....
	1912	[12] 1,189	....	....	....	....	[13] 298	....	....
	1911	[12] 1,188	....	....	....	....	[13] 298	....	....
	1910	1,573	[1] 120	418	1,309	13	351	....	....
	June 25, 1909	[12] 1,153	....	....	....	....	[13] 284	....	....
	June 25, 1908	[12] 1,149	....	....	....	....	[13] 281	....	....
	1907	1,491	[1] 134	221	904	6	329	....	....
	1906	1,475	[1] 142	219	912	6	326	....	....
	1905	1,481	[1] 142	220	938	6	324	....	....
	1900	1,428	[1] 119	211	985	8	311	....	....
	1895	1,409	[1] 130	197	1,067	15	301	....	....
	1890	1,305	[1] 86	194	1,054	15	293	....	....
	1885	1,163	[1] 55	166	978	21	282	....	....
	1880	1,031	[1] 53	155	977	20	276	....	....
	1875	1,120	[1] 80	202	1,011	27	285	....	....
	1870	998	[1] 60	190	921	31	255	....	....
	1865	954	[1] 40	227	910	25	262	....	....
France................	Dec. 31, 1919	12,374	....	4,081	8,991	1,167	2,413	167	303
	Dec. 31, 1918	12,251	....	3,080	9,061	1,197	2,232	139	312
	Dec. 31, 1917	12,242	....	4,165	9,882	....	2,303	144	319
	[14] Dec. 31, 1916	12,312	....	4,362	10,845	1,177	2,246	148	327
	[14] Dec. 31, 1915	12,511	....	4,916	12,379	1,230	2,156	144	321
	[14] Dec. 31, 1914	12,668	....	5,926	14,038	1,317	2,105	152	337
	Dec. 31, 1913	14,807	....	7,048	16,213	1,453	3,231	193	360
	1912	14,706	....	6,904	16,468	1,409	3,222	196	359
	1911	14,552	....	6,720	16,425	1,424	3,236	194	361
	1910	14,532	....	6,900	17,111	1,418	3,198	193	370
	1909	14,298	....	7,306	17,358	1,418	3,236	194	361
	1908	14,240	....	7,202	17,456	1,425	3,215	194	363
	1907	13,950	....	6,955	17,460	1,421	3,095	192	361

[1] Reindeer.
[2] Less than 500.
[6] Owned by Europeans only.
[12] Exclusive of animals under 2 years of age.
[13] Exclusive of animals under 3 years of age.
[14] Excludes invaded area.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
France (continued)	1906	13,968	....	7,049	17,461	1,457	3,165	195	362
	1905	14,316	....	7,559	17,783	1,477	3,169	199	365
	1904	14,137	....	7,522	17,801	1,462	3,139	201	363
	1903	14,105	....	7,561	17,954	1,563	3,082	208	357
	1902	14,929	....	7,209	18,477	1,532	3,028	206	364
	1901	14,674	....	6,758	19,670	1,529	2,926	200	355
	1900	14,521	....	6,740	20,180	1,558	2,903	205	356
	Nov. 30, 1892	*13,709*	....	*7,421*	*21,116*	*1,845*	*2,795*	*217*	*369*
	1882	*12,997*	....	*7,147*	*23,809*	*1,851*	*2,838*	*251*	*296*
	1862	*12,812*	....	*6,038*	*29,530*	*1,726*	*2,914*	....	....
Alsace-Lorraine	Dec. 2, 1919	415	....	309	31	114	89	....	....
	Dec. —, 1918	[15] 393	....	247	37	121	70	....	....
	Dec. —, 1917	[15] 445	....	274	35	105	67	....	....
French establishments in India	1918	50		....	18	25	....	....	....
	1917	49		....	17	25	....	....	....
	1916	49		....	16	25	....	....	....
	1915	50		....	16	24	....	....	....
	1914	64		....	14	23	....	....	....
	1913	51		....	13	21	....	....	....
	1912	50		....	12	23	....	....	....
	1911	39		....	9	18	....	....	....
	1910	47		....	10	24	....	....	....
	1909	47		....	9	24	....	....	....
Germany	Sept. 1, 1920	16,904	....	14,269	6,630	4,875	....	....	....
	Dec. 1, 1919	*16,524*	....	*11,594*	*5,373*	*4,143*	*3,503*	....	....
	[17] *Dec. 4, 1918*	*16,446*	....	*9,227*	*4,905*	*4,021*	[18] *2,977*	....	....
	[17] *Dec. 1, 1917*	*19,650*	....	*10,778*	*4,918*	*4,021*	[18] *3,257*	....	....
	Dec. 1, 1916	*20,874*	....	*17,002*	*4,979*	*3,940*	[18] *3,304*	....	....
	Dec. 1, 1915	*20,317*	....	*17,287*	*5,073*	*3,438*	[18] *3,342*	....	....
	Dec. 1, 1914	*21,829*	....	*25,341*	*5,471*	*3,538*	[18] *3,435*	....	....
	Dec. 1, 1913	*20,994*	....	*25,659*	*5,521*	*3,548*	*3,227*	....	....
	Dec. 2, 1912	*20,182*	....	*21,924*	*5,803*	*3,410*	*4,523*	*13*	
	Dec. 2, 1907	*20,631*	....	*22,147*	*7,704*	*3,534*	*4,345*	*11*	
	Dec. 1, 1904	*19,332*	....	*18,921*	*7,907*	*3,330*	*4,267*	....	....
	Dec. 1, 1900	*18,940*	....	*16,807*	*9,693*	*3,267*	*4,195*	*8*	
	Dec. 1, 1897	*18,491*	....	*14,275*	*10,867*	....	*4,038*	....	....
	Dec. 1, 1892	*17,556*	....	*12,174*	*13,590*	*3,092*	*3,836*	*7*	
	Jan. 10, 1883	*15,787*	....	*9,206*	*19,190*	*3,641*	*3,523*	*10*	....
Grenada (British)	1918	....	....	2	4	5	....	1	1
	1914	....	....	....	....	....	2	....	....
	1911	*5*	....	....	....	....	*2*	....	....
	1901	*2*	....	....	*2*	....	*1*	....	....
Gibraltar	1916	(2)	....	....	....	....	(2)	....	....
	1915	(2)	....	....	(2)	....	(2)	....	....
	1914	(2)	....	....	(2)	....	(2)	....	....
	1913	(2)	....	....	(2)	....	(2)	....	....
	1912	(2)	....	....	(2)	....	(2)	....	....
	1911	(2)	....	....	....	....	(2)	....	....
	1910	(2)	....	....	....	....	(2)	....	....
	1909	(2)	....	....	....	....	(2)	....	....
	1908	(2)	....	....	....	....	(2)	....	....
	1907	(2)	....	....	....	....	(2)	....	....
	1906	(2)	....	....	....	....	(2)	....	....
	1905	....	....	....	....	....	(2)	....	....
	1904	....	....	....	....	....	(2)	....	....
Greece	[3] 1918	442	....	30	4,796	....	212	123	290
	1917	*582*	....	*350*	*5,548*	*3,575*	*210*	*120*	*275*
	1914	300	....	227	3,547	2,638	149	80	133
	[5] *1911*	....	*6*	*227*	*3,545*	*2,638*	*149*	*80*	*133*
Guatemala	1915	620	....	103	383	57	116		....
	1914	655	....	177	402	59	114		....
	1913	557	....	188	514	11	64	33	....

[2] Less than 500.
[3] Unofficial estimate.
[5] Old boundaries.
[15] Exclusive of 221,000 dairy cows in 1918 and 232,000 in 1917.
[17] Exclusive of Alsace-Lorraine.
[18] Exclusive of army horses.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Honduras [20]	1913–14	489	....	180	5	23	68	20	4
	1912–13	441	....	144	3	24	72	18	5
	1911–12	420	....	118	5	6	88	15	4
	1910–11	293	....	102	....	14	[19] 66	....	4
Hongkong (British)	1916	2	....	....	....	....	(2)	....	....
	1915	1	....	....	....	....	(2)	....	....
	1914	1	....	....	....	....	(2)	....	....
	1913	1	....	....	....	....	(2)	....	....
	1912	1	....	....	....	(2)	(2)	....	....
	1911	2	....	....	....	(2)	(2)	....	....
	1910	2	....	....	(2)	(2)	(2)	....	....
	1909	1	....	....	(2)	(2)	(2)	....	....
	1908	1	....	....	(2)	(2)	(2)	....	....
	1907	1	....	....	(2)	(2)	(2)	....	....
	1906	1	....	....	(2)	(2)	(2)	....	....
	1905	1	....	....	(2)	(2)	(2)	....	....
	1904	1	....	....	(2)	(2)	(2)	....	....
	1903	1	....	....	(2)	(2)	(2)	....	....
	1902	1	....	....	(2)	(2)	(2)	....	....
	1901	1	....	....	....	(2)	(2)	....	....
Hungary [5]	Apr. 30, 1913	6,045	162	6,825	6,560	269	2,005	1	16
	Apr. 30, 1912	5,880	157	7,410	7,168	314	1,960	1	16
	Apr. 30, 1911	5,793	149	6,167	7,510	331	1,967	1	18
	Feb. 28, 1911	*6,184*		*6,416*	*7,698*	*331*	*2,001*	*1*	*18*
	Apr. 30, 1910	5,562	161	4,497	6,913	260	1,880	1	16
	Apr. 30, 1909	6,058	182	4,790	7,357	264	1,876	1	15
	Apr. 30, 1908	6,260	187	5,359	7,873	277	1,860	1	15
	Apr. 30, 1907	5,787	166	4,869	7,549	266	1,798	1	14
	Apr. 30, 1906	5,466	159	4,337	6,891	230	1,788	1	14
	Apr. 30, 1905	5,372	162	4,257	6,589	....	1,795	....	....
	Apr. 30, 1904	5,522	157	4,275	6,843	....	1,893	....	....
	Nov. 20, 1895	*5,830*		*6,447*	*7,527*	*237*	*1,997*	*22*	
	1884	*4,879*		*4,804*	*10,595*	*270*	*1,749*	*23*	
Iceland	1917	26	....	....	604	1	51	....	....
	1916	26	....	....	589	1	49	....	....
	1915	25	....	....	556	1	47	....	....
	1914	25	....	....	585	1	47	....	....
	1913	27	....	....	635	1	47	....	....
	1912	26	....	....	601	1	46	....	....
	1911	26	....	....	574	1	44	....	....
	1910	26	....	....	579	1	45	....	....
	1909	25	....	....	557	1	44	....	....
	1908	23	....	....	512	1	45	....	....
	1907	24	....	....	526	1	47	....	....
	1906	26	....	....	550	(2)	49	....	....
	1905	27	....	....	543	(2)	49	....	....
	1904	26	....	....	495	(2)	48	....	....
	1903	27	....	....	486	(2)	46	....	....
	1902	27	....	....	699	(2)	45	....	....
	1901	26	....	....	688	(2)	43	....	....
India (British) [22]	1917–18	129,876	19,235	....	[25] 22,895	[25] 33,165	[25] 1,681	[25] 71	[25] 1,534
	1916–17	130,087	19,266	....	[25] 22,913	[25] 33,423	[25] 1,682	[25] 72	[25] 1,536
	1915–16	129,684	19,188	....	[25] 22,960	[25] 33,664	[25] 1,673	[25] 70	[25] 1,538
	1914–15	128,235	19,004	....	[25] 23,005	[25] 33,360	[25] 1,654	[25] 72	[25] 1,511
	1913–14	124,965	18,214	....	[25] 23,081	[25] 30,694	[25] 1,644	[25] 79	[25] 1,508
	1912–13	120,420	17,709	....	[25] 22,934	[25] 28,684	[25] 1,555	[25] 81	[25] 1,364
	[23] 1911–12	103,803	17,106	....	23,290	30,914	1,574	113	1,341
	[23] 1910–11	103,595	17,063	....	23,281	30,900	1,565	113	1,342
	[23] 1909–10	102,418	16,951	....	23,235	30,604	1,553	113	1,337
	[23] 1908–09	98,681	15,851	....	20,188	31,791	1,557	101	1,209
	[24] 1907–8	78,842	13,196	....	18,033	25,221	1,312	55	1,194
	[24] 1906–7	78,426	13,241	....	18,030	25,150	1,308	55	1,191
	[24] 1905–6	78,001	13,130	....	18,029	25,169	1,302	55	1,194
	[24] 1904–5	77,111	12,871	....	17,562	24,803	1,278	54	1,177
	[24] 1903–4	75,662	12,492	....	17,890	24,868	1,269	54	1,173
	[24] 1902–3	13,102	12,033	....	17,643	19,622	1,301	1,216	

[2] Less than 500.
[5] Old boundaries.
[19] Mares only.
[20] Enumerated from tax returns.
[22] Young buffaloes included in cattle figures and excluded from buffalo figures.
[23] Exclusive of Eastern Bengal.
[24] Exclusive of Bengal and Eastern Bengal.
[25] Exclusive of Bengal.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
India (British)[22] (con.).	1901–2	73,162	12,134	....	17,736	19,297	1,309	1,222	
	1900–1901	72,362	12,073	....	17,722	19,139	1,306	1,227	
	1899–1900	72,666	12,120	....	17,805	19,005	1,308	1,227	
	1894–95	67,045	11,826	....	17,260	15,272	1,134	1,102	
India (Native States)[22]	1917–18	12,691	1,863	....	9,139		203	163	
	1916–17	12,999	1,802	....	9,448		200	161	
	1915–16	12,888	1,815	....	8,959		174	165	
	1914–15	12,107	1,784	....	8,448		181	172	
	1913–14	12,254	1,772	....	8,326		176	182	
	1912–13	12,032	1,743	....	8,157		169	178	
	1911–12	11,801	1,733	....	8,150		160	172	
	1910–11	11,290	1,702	....	8,430		148	166	
	1909–10	10,391	1,559	....	7,129		141	155	
	1908–9	9,866	1,471	....	6,980		129	144	
	1907–8	8,818	1,324	....	6,819		109	147	
	1906–7	7,651	1,190	....	6,213		89	124	
	1905–6	7,629	1,172	....	6,078		81	120	
	1904–5	8,178	1,347	....	6,318		92	129	
	1903–4	8,098	1,249	....	6,455		92	122	
	1902–3	7,666	1,159	....	6,207		90	121	
	1901–2	7,468	1,091	....	5,742		88	119	
	1900–1901	7,396	1,228	....	4,538		85	115	
Italy	*Apr. 6, 1918*	*6,240*	*24*	*2,339*	*11,754*	*3,083*	[26] *990*	*497*	*949*
	1914	6,646		2,722	13,824			2,235	
	Mar. 19, 1908	*6,199*	*19*	*2,508*	*11,163*	*2,715*	*956*	*388*	*850*
	Feb. 13, 1881	*4,772*	*11*	*1,164*	*8,596*	*2,016*	*658*	*294*	*674*
Jamaica	1918	167	....	32	12	30	....	....	....
	1916	115	....	....	11	....	47	....	21
	1915	114	....	31	9	....	51	....	....
	1914	115	....	31	11	....	55	....	....
	1913	116	....	31	10	....	53	....	....
	1912	116	....	31	12	....	54	....	....
	1911	108	....	31	12	....	59	....	....
	1910	111	....	32	12	....	52	....	....
	1909	110	....	31	13	....	53	....	....
	1908	102	....	30	14	....	52	....	....
	1907	105	....	30	15	....	50	....	....
	1906	110	....	29	16	....	68	....	....
	1905	112	....	29	17	....	73	....	....
	1904	108	....	27	20	....	74	....	....
	1903	119	....	25	18	....	52	....	....
	1902	120	....	20	17	....	58	....	....
	1901	120	....	20	17	....	58	....	....
	1900	119	....	18	17	....	55	....	....
Japan	Dec. 31, 1918	1,307	....	398	5	92	1,511	....	....
	Dec. 31, 1917	1,304	....	360	3	110	1,560	....	....
	Dec. 31, 1916	1,343	....	328	3	109	1,572	....	....
	Dec. 31, 1915	1,388	....	333	3	97	1,580	....	....
	Dec. 31, 1914	1,387	....	332	3	95	1,579	....	....
	Dec. 31, 1913	1,389	....	310	3	89	1,582	....	....
	Dec. 31, 1912	1,399	....	309	3	101	1,582	....	....
	Dec. 31, 1911	1,405	....	299	3	100	1,576	....	....
	Dec. 31, 1910	1,384	....	279	4	92	1,565	....	....
	Dec. 31, 1909	1,350	....	287	3	87	1,551	....	....
	Dec. 31, 1908	1,298	....	285	3	83	1,495	....	....
	Dec. 31, 1907	1,237	....	318	4	81	1,495	....	....
	Dec. 31, 1906	1,190	....	285	4	75	1,465	....	....
	Dec. 31, 1905	1,168	....	228	4	72	1,368	....	....
	Dec. 31, 1904	1,200	....	192	3	68	1,390	....	....
	Dec. 31, 1903	1,286	....	158	2	62	1,524	....	....
	Dec. 31, 1902	1,275	....	159	2	62	1,515	....	....
	Dec. 31, 1901	1,282	....	155	3	55	1,533	....	....
	Dec. 31, 1900	1,261	....	150	2	60	1,542	....	....
Chosen (Korea)	Dec. 31, 1917	1,385	....	832	1	15	55	2	12
	Dec. 31, 1916	1,353	....	780	....	11	53	1	13
	Dec. 31, 1915	1,354	....	767	....	14	55	1	13
	Dec. 31, 1914	1,338	....	758	....	12	53	1	14
	Dec. 31, 1913	1,211	....	761	....	10	51	....	13
	1912	1,011	....	617	(2)	10	47	1	12
	1911	906	....	573	....	8	41	(2)	10
	1910	704	....	566	....	7	40	1	8

[2] Less than 500. [22] Young buffaloes included in cattle figures and excluded from buffalo figures.
[26] Including 855 in transit, and 186,328 belonging to the Royal Army.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Formosa (Taiwan)	Dec. 31, 1917	1	[27] 376	1,273	(2)	100	(2)	....	....
	Dec. 31, 1916	2	385	1,319	(2)	118	(2)	....	....
	Dec. 31, 1915	2	397	1,313	(2)	117	(2)	....	....
	Dec. 31, 1914	2	398	1,018	(2)	125	(2)	....	....
	Dec. 31, 1913	1	[27] 418	1,322	(2)	129	(2)	....	....
	Dec. 31, 1912	1	[27] 445	1,277	(2)	126	(2)	....	....
	Dec. 31, 1911	1	[27] 477	1,290	(2)	129	(2)	....	....
	Dec. 31, 1910	1	[27] 479	1,308	(2)	137	(2)	....	....
	Dec. 31, 1909	1	[27] 459	1,268	(2)	144	(2)	....	....
	Dec. 31, 1908	1	[27] 414	1,231	(2)	144	(2)	....	....
	Dec. 31, 1907	1	[27] 373	1,146	(2)	129	(2)	....	....
Karafuto (Japanese)	Dec. 31, 1917	1	....	1	....	....	3	....	....
	Dec. 31, 1916	1	....	1	....	....	3	....	....
	Dec. 31, 1915	1	....	(2)	....	....	2	....	....
	Dec. 31, 1914	1	....	(2)	....	....	2	....	....
	Dec. 31, 1913	1	....	(2)	....	....	2	....	....
	Dec. 31, 1912	1	....	(2)	....	....	1	....	....
	Dec. 31, 1911	1	....	(2)	....	....	2	....	....
	Dec. 31, 1910	1	....	(2)	....	....	1	....	....
	Dec. 31, 1909	1	....	(2)	....	....	1	....	....
	Dec. 31, 1908	1	....	1	....	....	1	....	....
	Dec. 31, 1907	1	....	....	....	....	1	....	....
Kwantung (Leased Province of Japan).	Dec. 31, 1917	31	....	76	1	6	3	13	29
	Dec. 31, 1916	31	....	76	1	6	4	13	27
	Dec. 31, 1915	31	....	63	1	17	3	13	26
	Dec. 31, 1914	31	....	71	1	13	3	13	28
	Dec. 31, 1913	31	....	66	1	12	3	13	27
	Dec. 31, 1912	31	....	64	2	12	3	13	26
	Dec. 31, 1911	31	....	57	....	8	4	14	28
	Dec. 31, 1910	31	....	69	2	11	4	13	28
	Dec. 31, 1909	28	....	61	1	8	4	12	25
	Dec. 31, 1908	24	....	68	2	9	4	12	25
Luxemburg	Dec. 4, 1919	89	....	89	5	13	18	(2)	(2)
	Nov. 8, 1918	*108*	....	*95*	*6*	*15*	*17*	....	....
	Oct. 18, 1917	*114*	....	*114*	*4*	*14*	*17*	....	....
	Dec. 9, 1916	*113*	....	*87*	*3*	*11*	*16*	....	....
	May 26, 1915	*114*	....	*94*	....	....	*18*	....	....
	Dec. 1, 1913	*102*	....	*137*	*5*	*10*	*19*	....	....
	Dec. 10, 1910	*94*	....	*128*	*6*	*10*	*19*	(2)	(2)
Madagascar [20]	*1917*	*6,676*	....	....	....	....	....	....	....
	Dec. 31, 1916	6,912	....	544	309	200	3	....	....
	1915	*6,151*	....	*600*	*295*	....	*3*	....	....
	1914	*5,885*	....	....	....	....	....	....	....
	1913	5,540	....	....	....	....	....	....	....
	1912	5,723	....	....	....	....	2	....	....
	1911	4,573	....	....	....	....	....	....	....
	1910	4,492	....	....	....	....	....	....	....
	1909	4,120	....	....	....	....	....	....	....
	1908	3,813	....	....	....	....	....	....	....
	1907	3,706	....	....	....	....	....	....	....
	1906	3,908	....	....	....	....	....	....	....
	1905	2,651	....	....	....	....	....	....	....
	1904	2,343	....	....	....	....	....	....	....
	1902	....	....	....	....	....	1	....	....
Malta	Mar. 31, 1920	4	....	....	19	18	....	....	....
	Mar. 31, 1919	4	....	....	19	18	....	....	....
	Mar. 31, 1918	3	....	5	18	....	2	....	....
	Mar. 31, 1917	4	....	3	18	....	3	....	....
	Mar. 31, 1916	5	....	3	19	....		9	
	Mar. 31, 1915	5	....	3	21	....	3	....	....
	Mar. 31, 1914	4	....	4	15	....	3	....	....
	Mar. 31, 1913	4	....	4	15	....		9	
	Mar. 31, 1912	6	....	4	1[illegible]	....		9	
	Mar. 31, 1911	7	....	5	18	....		9	

[2] Less than 500. [20] Enumerated from tax returns. [27] Includes zebus.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Malta (continued) ...	Mar. 31, 1910	7	....	4	17	....		9	
	Mar 31, 1909	7	....	4	18	....		10	
	Mar. 31, 1908	7	....	6	14	....		11	
	Mar. 31, 1907	6	....	5	20	....		11	
	Mar 31, 1906	7	....	5	19	....		11	
	Mar. 31, 1905	8	....	5	19	....		11	
	Mar. 31, 1904	8	....	5	17	....		10	
	Mar 31, 1903	8	....	5	16	....		10	
	Mar. 31, 1902	6	....	4	15	....		10	
	Mar. 31, 1901	8	....	6	14	....		10	
	Mar. 31, 1900	8	....	5	14	....		11	
Mauritius (British)[28].	1918	33	....	....	....	....	....	....	....
	1917	17	....	4	2	7	1	(2)	(2)
	1916	18	....	4	1	6	1	(2)	(2)
	1915	20	....	4	1	....	1	....	....
	1914	*41*	....	*16*	*2*	....	*2*	....	....
	1913	22	....	8	1	....	1	....	....
	1912	19	....	6	1	....	1	....	....
	1911	17	....	6	1	....	1	....	....
	1910	16	....	4	1	....	1	....	....
	1909	13	....	4	2	....	1	....	....
	1908	12	....	4	1	....	1	....	....
	1907	11	....	4	1	....	1	....	....
	1906	10	....	5	1	....	1	....	....
	1905	8	....	14	1	....	1	....	....
	1904	7	....	4	1	....	1	....	....
	1903	7	....	4	1	....	1	....	....
	1902	8	....	4	1	....	(2)	....	....
	1901	11	....	5	1	....	(2)	....	....
	1900	10	....	4	1	....	(2)	....	....
Mexico................	*June 30, 1902*	*5,142*	....	*616*	*3,424*	*4,206*	*859*	*334*	*288*
Morocco:									
Eastern..........	1915–16	22	....	....	664	235	....	....	....
Western..........	May – June, 1918.	1,173	....	103	4,194	1,258	119	46	338
	May – June, 1916–17.	1,030	....	51	4,290	1,266	108	43	286
	May – June, 1915–16.	856	....	29	4,054	1,227	141		251
	May – June, 1914–15.	....	....	16	3,175	1,062	123		226
Netherlands..........	Mar. —, 1919	1,969	....	450	437	....	362	....	....
	Aug. —, 1918	2,049	....	600	642	311	378	....	....
	Apr. 11, 1917	2,304	....	1,185	521	....	....	....	....
	May —, 1915	2,390	....	1,487	....	....	....	....	....
	June —, 1913	2,097	....	1,350	842	232	334	....	....
	May 20 } *June 20* } *1910*	*2,027*	....	*1,260*	*889*	*224*	*227*	....	....
	Dec. 31, 1904	1,691	....	862	607	166	295	....	....
	1903	1,660	....	882	652	170	296	....	....
	1902	1,647	....	823	709	176	304	....	....
	1901	1,650	....	764	752	177	302	....	....
	1900	1,656	....	747	771	180	295	....	....
	1890	1,533	....	579	819	165	273	....	....
	1880	1,470	....	335	848	158	278	....	....
	1870	1,411	....	329	900	137	252	....	....
	1859	1,246	....	261	802	111	237	....	....
	1851	1,244	....	270	812	....	233	....	....
Newfoundland.......	*1911*	*32*	....	*19*	*75*	*15*	*13*	....	....
	1901	*33*	....	*35*	*78*	*17*	*9*	....	....
New Zealand.........	1920	3,059	....	260	23,915	....	344	(2)	(2)
	1919	3,035	....	235	25,829	17	363	(2)	
	1918	2,869	....	259	26,538	18	378	(2)	
	1917	2,575	....	284	25,270	18	374	(2)	
	1916	2,417	....	298	24,788	18	371	(2)	
	1915	....	....	....	24,901	....	....	....	....
	1914	....	....	....	24,799	....	....	....	....
	1913	....	....	....	24,192	....	....	....	....
	1912	....	....	....	23,750	....	....	....	....

[2] Less than 500.
[28] Years 1914 and 1918 include *all* animals. Other years, animals on sugar plantations only.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
New Zealand (con.)	*Apr. —, 1911*	*2,020*		*349*	*23,996*	*6*	*404*	(2)	
	1910				24,270				
	1909				23,481				
	1908–9	1,773		245	22,449		363	1	
	1907–8	1,816		241	20,984		353	(2)	
	1906–7	1,852		242	20,108		343	(2)	
	1905–6	1,811		250	19,131		327	(2)	
	1904–5	1,737		255	18,281		314	(2)	
	1903–4	1,594		227	18,955		299	(2)	
	1902–3	1,461		194	20,343		287	(2)	
	1901–2	1,362		224	20,233		280	(2)	
	1900–1	1,257		251	19,355		266	(2)	
	1899–1900	1,222		250	19,349		262	(2)	
	1895	1,048		240	19,827		237	(2)	
	1891	*832*		*309*	*16,754*	*9*	*211*	(2)	
	1886	*853*		*278*	*15,174*	*10*	*187*	(2)	
	1881	*699*		*200*	*12,190*	*11*	*162*	(2)	
	1878	*578*		*207*	*13,069*	*14*	*138*	(2)	
	1874	*495*		*124*	*11,705*	*14*	*100*	(2)	
	1871	*437*		*151*	*9,701*	*12*	*81*	(2)	
	1867	*313*		*115*	*8,419*	*12*	*66*	(2)	
	1864	*250*		*61*	*4,937*	*12*	*49*	(2)	
	1861	*193*		*43*	*2,761*	*12*	*28*	(2)	
	1858	*137*		*41*	*1,523*	*12*	*15*	(2)	
Norway	[29] June 20, 1918	1,038		209	1,185	199	210		
	Sept. 30, 1916	1,119		221	1,281	230	189		
	Sept. 30, 1915	1,121		209	1,330	240	186		
	Sept. 30, 1914	1,146		228	1,327	237	182		
	Sept. 30, 1910	1,134		334	1,398	288	168		
	Sept. 30, 1907	*1,089*	[1] *143*	*307*	*1,391*	*296*	*164*		
	Dec. 3, 1900	950	[1] 109	165	999	215	173		
	1890	1,006	[1] 170	121	1,418	272	151		
Nigeria (Colony)	1902	2		2	2		(2)		
	1901	1		2	2		(2)		
	1900	1		2	2		(2)		
	1899	1		3	2		(2)		
Nyasaland Protectorate	Mar. 31, 1918	93		20	40	170		(2)	
	Mar. 31, 1917	91		23	35	171		(2)	
	Mar. 31, 1916	82		24	30	131		(2)	
	Mar. 31, 1915	82		22	28	139		(2)	
	Mar. 31, 1914	76		23	28	137		(2)	
	Mar. 31, 1913	63		22	23	138		(2)	
	Mar. 31, 1912	60		19	22	112		(2)	
	Mar. 31, 1911	55		11	15	112		(2)	
	Mar. 31, 1910	58		14	18	102		(2)	
	Mar. 31, 1909	55		[30] 37	19			(2)	
	Mar. 31, 1908	52		20	17			(2)	
	Mar. 31, 1907	49		2	15			(2)	
	Mar. 31, 1906	29			12			(2)	
	Mar. 31, 1905	27			12			(2)	
	Mar. 31, 1904	19			4			(2)	
	Mar. 31, 1903	8			8			(2)	
	Mar. 31, 1902	6			6			(2)	
Papua, territory of (British)	1917	1		(2)	(2)		(2)		
	1916	1		(2)	(2)		(2)		
	1915	2		(2)	(2)		(2)		
	1914	2		(2)	(2)		(2)		
	1913	2		(2)	(2)		(2)		
	1912	1		(2)	(2)		(2)		
	1911	1		(2)	(2)		(2)		
	1910	1		(2)	(2)		(2)		
	1909	1		(2)	(2)		(2)		
	1908	1		(2)	(2)		(2)		
	1907	1					(2)		
	1906	(2)					(2)		
	1905	(2)					(2)		
	1904	1					(2)		

[1] Reindeer. [2] Less than 500. [29] Incomplete.
[30] There was a large increase in the estimated number of pigs in the Upper Shire District in 1908.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Paraguay	Dec. 31, 1918	5,500	....	87	600	93	490	19	20
	1915	5,249	....	61	600	87	478	17	18
	1914	4,952	....	....	....	....	....	....	....
	1913	4,672	....	....	....	....	....	....	....
	1912	4,407	....	....	....	....	....	....	....
	1911	4,158	....	....	....	....	....	....	....
	1910	3,922	....	....	....	....	....	....	....
	1909	3,700	....	....	....	....	....	....	....
	1908	3,491	....	....	....	....	....	....	....
	1907	3,293	....	....	....	....	....	....	....
	1906	3,107	....	....	....	....	....	....	....
	1905	2,931	....	....	....	....	....	....	....
	1904	2,765	....	....	....	....	....	....	....
	1903	2,609	....	....	....	....	....	....	....
	1902	*2,461*	....	*37*	*222*	*50*	*218*	*9*	*5*
	1899	*2,283*	....	*24*	*214*	*32*	*183*	*3*	*4*
	1886	*730*	....	*12*	*34*	*11*	*62*	*2*	*2*
	1877	*201*	....	*8*	*7*	....	*21*	*1*	*2*
Philippine Islands [31]	Dec. 31, 1917	557	1,204	....	....	....	198	....	....
	Dec. 31, 1916	566	1,229	2,735	130	604	203	....	....
	Dec. 31, 1915	534	1,222	2,521	129	644	223	....	....
	Dec. 31, 1914	478	1,147	2,286	118	592	216	....	....
	Dec. 31, 1913	418	1,047	2,087	104	528	179	....	....
	Dec. 31, 1912	362	957	1,888	99	476	171	....	....
	Dec. 31, 1911	315	864	1,703	93	455	152	....	....
	Dec. 31, 1910	270	757	1,682	94	441	143	....	....
	1903	*128*	*641*	....	....	....	*144*		....
Portugal	Mar. —, 1920	741	....	921	3,851	1,493	....	....	....
	Oct. —, 1906	*708*	....	*1,111*	*3,073*	*1,034*	*88*	*58*	*144*
	1870	*625*	....	*971*	*2,977*	*937*	*87*	*51*	*138*
Poland	In summer. 1914	2,014	....	452	565	....	1,098	....	....
	1913	2,011	(2)	491	683	9	1,116	(2)	(2)
	1910	2,301	(2)	612	1,050	9	1,222	(2)	(2)
	1900	2,823	(2)	1,402	2,823	11	1,392	(2)	1
	1890	3,013	(2)	1,499	3,755	....	1,207	(2)	....
	1881	5,055	(2)	706	3,375	10	1,037	....	....
Rhodesia: Southern	Dec. 31, 1918	1,211	....	[6] 15	[6] 51	[6] 21	[6] 2	[6] 2	[6] 9
	Dec. 31, 1917	1,200	....	[6] 31	368	766		[32] 6	
	Dec. 31, 1916	960	....	60	357	723		[32] 5	
	Dec. 31, 1915	841	....	46	312	688		[32] 4	
	Dec. 31, 1914	748	....	[6] 13	324	675		[32] 3	
	1913	600	....	....	[32] 266	....		[32] 3	
	1912	600	....	....	[32] 255	....		[32] 3	
	1911	*464*	....	....	*292*	*602*		...	
	1910	371	....	....	[32] 232	628		[32] 2	
	[32] 1909	233	....	....	216	595		2	
	[32] 1908	204	....	....	203	....	....	....	....
	[32] 1907	180	....	....	167	....	....	....	....
	[32] 1906	145	....	....	141	....	....	....	....
	1904	*145*	....	....	....	....	....	....	....
	1901	44	....	....	49	....	....	....	....
Northern	1912	255	....	....	....	....	....	....	....
	1911	[6] *37*	....	....	*8*	....	....	....	....
	1910	[6] 34	....	....	....	....	....	....	....
	1909	[6] 39	....	....	....	....	....	....	....
Roumania	[3] 1919	1,125	....	84	415	....	149	....	....
	[3] Feb. 15, 1917	1,050	....	371	1,655	84	299	....	....
	Apr. —, 1916	2,938		1,382	7,811	301	1,219	(2)	12
	1911	2,667		1,021	5,269	187	825	4	
	1907	2,585		1,124	5,105	191	808	5	
	Dec. —, 1900	*2,545*	*44*	*1,709*	*5,655*	*233*	*864*	*1*	*7*
	1896	2,138		1,079	6,848	287	671	5	
	1890	2,520		926	5,002	210	595	6	
	1888	2,406		797	4,973	165	563	6	
	1884	2,376		886	4,655	245	533	2	
	[33] 1873	1,833		804	4,191	185	391	....	5
	[33] 1860	2,608		1,051	4,410	410	461	....	7

[2] Less than 500.
[3] Unofficial estimate.
[6] Owned by Europeans only.
[31] Figures in buffalo column are for carabao only.
[32] Animals owned by natives only.
[33] Bessarabia excluded.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Russia (European)[34]	In summer [35] 1916	38,373	....	16,603	63,833		23,476	....	....
	[36] 1915	32,886	....	12,301	41,553		22,375	....	....
	1914	32,704	....	11,581	37,240	....	22,529	....	....
	1913	31,974	[1] 605	13,458	41,426	873	22,771	6	7
	1912	31,017	[1] 464	12,636	39,622	766	22,131	6	3
	1911	31,023	[1] 461	12,654	40,157	854	21,820	5	3
	1910	31,315	[1] 462	12,049	40,734	857	21,868	4	3
	1909	30,492	[1] 480	11,330	39,931	782	21,321	5	2
	1908	29,687	[1] 430	11,389	40,222	749	20,958	6	2
	1907	29,675	[1] 409	11,575	40,749	839	20,478	(2)	2
	1906	30,514	[1] 455	11,858	42,167	897	20,468	2	
	1905	31,194	[1] 438	11,471	46,835		20,783	(2)	1
	1904	31,870	[1] 433	11,994	47,939		20,746	2	
	1903	31,844	[1] 409	11,438	46,926	1,006	20,348	(2)	2
	1902	32,184	[1] 365	11,649	47,816	1,129	20,478	1	1
	1901	31,903	[1] 357	12,117	38,803	1,178	20,160	(2)	2
	1900	31,661	[1] 350	11,761	47,628	1,017	19,744	(2)	2
	1895	24,521	[1] 368	9,188	38,212	916	17,042	....	(2)
	1890	25,528	....	9,554	46,052	....	19,779	....	....
	1881	22,122	....	9,265	44,171	1,157	15,534	(2)	(2)
Russia (Asiatic) (33 governments of the Caucasus, Central Asia, and Siberia)	1915	[37] 14,772	....	2,962	34,468	....	11,346	....	....
	1914	18,817	....	3,184	49,181	4,498	12,041	....	....
	1913	18,404	....	2,895	38,696	4,791	11,959	....	....
	[38] 1912	17,535	....	2,447	37,876	4,082	11,666	....	....
	[38] 1911	17,628	....	2,421	39,77[illegible]	4,179	11,913	....	....
	[38] 1910	17,788	....	2,709	38,716	4,162	11,822	....	....
	[39] 1909	17,359	....	2,499	40,212	4,418	11,190	....	....
	[39] 1908	16,833	....	2,305	40,560	3,852	10,826	....	....
	[39] 1907	16,595	....	2,210	40,106	4,005	10,312	....	....
St. Helena (British)	*1911*	*1*	....	(2)	*4*	*1*	(2)	....	....
	1901	*1*	....	(2)	*2*	*1*	(2)	....	....
St. Lucia (British)	1916	....	....	....	....	....	1	....	....
	1915	....	....	....	....	....	1	....	....
	1914	....	....	....	....	....	1	....	....
Serbia	[3] 1914	1,251		1,300	4,100		174	3	
	Dec. 31, 1910	*957*	*7*	*866*	*3,819*	*631*	*153*	*1*	....
	Dec. 31, 1905	*963*	*7*	*908*	*3,160*	*510*	*174*	*1*	*1*
Seychelles Islands (British)	1917	1	....	....	(2)	....	(2)	....	....
	1916	1	....	5	(2)	....	(2)	....	....
	1915	1	....	6	(2)	....	(2)	....	....
	1914	1	....	6	(2)	....	(2)	....	....
	1913	1	....	6	(2)	....	(2)	....	....
	1912	1	....	6	(2)	....	(2)	....	....
	1911	1	....	6	(2)	....	(2)	....	....
	1910	1	....	5	(2)	....	(2)	....	....
	1909	1	....	6	(2)	....	(2)	....	....
	1908	1	....	6	(2)	....	(2)	....	....
	1907	1	....	6	(2)	....	(2)	....	....
	1906	1	....	6	(2)	....	(2)	....	....
	1905	1	....	6	(2)	....	(2)	....	....
	1904	1	....	5	(2)	....	(2)	....	....
	1903	1	....	5	(2)	....	(2)	....	....
	1902	1	....	5	(2)	....	(2)	....	....
	1901	1	....	4	(2)	....	(2)	....	....
	1900	1	....	4	(2)	....	(2)	....	....
Sierra Leone (British)	1910	2	....	(2)	1	....	(2)	....	....
	1909	(2)	....	(2)	(2)	....	(2)	....	....
	1908	1	....	(2)	1	....	(2)	....	....
	1907	2	....	(2)	1	....	(2)	....	....
	1906	1	....	(2)	(2)	....	(2)	....	....
	1905	1	....	(2)	1	....	(2)	....	....
Spain	[3] *1918*	*3,712*	....	*4,997*	*18,601*	*4,476*	....	....	....
	Dec. 31, 1917	3,233	....	3,930	17,227	4,182	558	1,013	921
	1916	3,071	....	2,814	16,012	3,207	489	913	839
	1915	*2,926*	....	*2,883*	*15,995*	*3,217*	*512*	*951*	*826*

[1] Reindeer.
[2] Less than 500.
[3] Unofficial estimate.
[34] 51 governments, Poland excluded.
[35] Total for 48 governments.
[36] 53 governments.
[37] 27 governments and provinces.
[38] 31 governments and provinces.
[39] 30 governments and provinces.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Spain (continued)....	Dec. 31, 1914	2,743	....	2,810	16,128	3,265	525	984	811
	1913	2,879	....	2,710	16,441	3,394	542	948	849
	1912	2,562	....	2,571	15,830	3,116	526	929	829
	1911	2,511	....	2,472	15,726	3,370	546	905	837
	Dec. 31, 1910	2,369	....	2,424	15,117	3,216	520	886	868
	Dec. 31, 1906	2,497	....	2,080	13,481	2,440	440	802	744
	1891	2,218	....	1,928	13,359	2,534	397	768	754
Straits Settlements...	1914	40	....	113	35	18	2	....	....
	1913	46	....	158	....	....	2	....	....
	1912	39	....	145	....	....	3	....	....
	1911	44	....	141	....	....	3	....	....
	1910	44	....	133	....	....	3	....	....
	1909	40	....	113	....	....	3	....	....
	1908	41	....	79	....	....	2	....	....
	1907	31	....	....	....	....	5	....	....
	1906	29	....	....	....	....	4	....	....
	1905	28	....	....	....	....	4	....	....
	1904	27	....	....	....	....	4	....	....
	1903	22	....	....	....	....	5	....	....
	1902	25	....	....	....	....	4	....	....
	1901	23	....	....	....	....	3	....	....
	1900	25	....	....	....	....	3	....	....
Swaziland (British)..	1917	150	....	9	250		1	....	....
	1916	135	....	9	230		1	....	....
	1915	100	....	9	230		1	....	....
	1914	90	....	9	200		1	....	....
	1913	73	....	9	170		1	....	....
	1912	58	....	9	164		1	....	....
	1911	58	....	9	164		1	....	....
	1910	59	....	....	10	....	....	....	....
	1909	50	....	....	10	....	1	....	....
	1908	50	....	....	10	....	1	....	....
Sweden...............	June 1, 1919	2,551	....	717	1,564	133	716	....	....
	June 1, 1918	2,584	....	634	1,409	133	715	....	....
	June 1, 1917	3,020	....	1,030	1,344	136	715	....	....
	June 1, 1916	2,913	....	1,065	1,198	132	701	....	....
	June 1, 1915	2,884	....	891	1,146	102	672	....	....
	Dec. 31, 1914	2,761	....	1,015	993	77	603	....	....
	Dec. 31, 1913	2,721	....	968	988	71	596	....	....
	Dec. 31, 1910	2,748	[1] 273	957	1,004	69	587	....	....
	Dec. 31, 1905	2,550	[1] 226	830	1,074	67	555	....	....
	Dec. 31, 1900	2,583	[1] 232	806	1,261	80	533	....	....
	Dec. 31, 1895	2,540	[1] 288	806	1,313	74	506	....	....
	Dec. 31, 1890	2,399	[1] 296	645	1,351	87	487	....	....
	Dec. 31, 1885	2,366	....	516	1,442	97	480	....	....
	Dec. 31, 1880	2,228	....	419	1,457	108	465	....	....
	Dec. 31, 1875	2,186	....	415	1,609	126	459	....	....
	Dec. 31, 1870	1,965	....	354	1,595	124	428	....	....
	Dec. 31, 1865	1,921	....	380	1,590	133	428	....	....
Switzerland..........	[40] Apr. —, 1920	960	....	372	186	273	73	3	1
	Apr. —, 1919	1,005	....	304	209	281	70	3	1
	Apr. 19, 1918	1,530	....	364	225	355	129	3	1
	Apr. 19, 1916	1,616	....	545	173	359	137	3	1
	Apr. 21, 1911	1,443	....	570	161	341	144	3	2
	Apr. 20, 1906	1,498	....	549	210	362	135	3	2
	Apr. 19, 1901	1,340	....	555	219	355	125	3	2
	Apr. 20, 1896	1,307	....	567	272	416	109	3	2
	Apr. 21, 1886	1,213	....	395	342	416	99	3	2
	Apr. 21, 1876	1,036	....	335	368	396	101	3	2
	Apr. 21, 1866	993	....	304	447	375	100	5	....
Trinidad and Tobago.	1917	11	....	....	4	....	12		
	1915	13	....	10	3	....	6	....	....
	1914	13	....	9	2	....	5	....	....
	1913	13	....	9	2	....	5	....	....
	1912	14	....	8	2	....	5	....	....
	1911	14	....	8	2	....	5	....	....
	1910	12	....	10	3	....	5	....	....
	1909	10	....	9	2	....	4	....	....
	1908	10	....	8	2	....	4	....	....

[40] Excludes cantons of Bern and Waadt.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
Tunis	Feb. 28, 1919	635	....	18	2,662	1,661	79	31	199
	Apr. 30, 1918	251	....	15	1,125	549	36	16	85
	Apr. 30, 1917	225	....	10	1,033	460	33	15	77
	Apr. 30, 1916	240	....	7	1,148	522	31	15	84
	July 31, 1915	269	....	12	1,119	499	32	17	82
	Dec. 31, 1914	189	....	20	642	394	35	20	90
	Dec. 31, 1913	217	....	17	729	505	37	23	95
	Dec. 31, 1912	225	....	19	767	492	37	22	92
	Dec. 31, 1911	191	....	18	687	469	39	13	87
	Dec. 31, 1910	171	....	8	616	333	37	20	80
	Dec. 31, 1909	173	....	10	724	399	32	99	
Turkey (European and Asiatic)	1919	[41] 3,740	[42] 378	....	11,200	2,065	630	85	825
	1913	[41] 2,835	[42] 2,697	....	18,722	16,463	711	145	1,374
	1912	....	....	73	27,095	[43] 20,269	....	....	....
	1911	....	....	164	25,435	[43] 18,730	....	....	....
	1910	....	....	175	27,662	[43] 21,283	....	....	....
	1909	....	....	180	23,142	[43] 18,003	....	....	....
	1908	....	....	180	26,779	[43] 17,091	....	....	....
	1907	....	....	172	24,248	[43] 16,896	....	....	....
	1906	....	....	187	24,581	[43] 17,645	....	....	....
	1905	....	....	196	23,614	[43] 16,411	....	....	....
Turk and Caicos Islands	1917	1	....	(2)	(2)	....	(2)	....	....
	1916	1	....	(2)	(2)	....	(2)	....	....
	1915	1	....	(2)	(2)	....	(2)	....	....
	1914	1	....	(2)	(2)	....	(2)	....	....
	1913	1	....	(2)	(2)	....	(2)	....	....
	1912	1	....	(2)	(2)	....	(2)	....	....
	1911	1	....	(2)	(2)	....	(2)	....	....
	1910	1	....	1	(2)	....	(2)	....	....
	1909	1	....	....	(2)	....	(2)	....	....
	1908	1	....	....	(2)	....	(2)	....	....
	1907	1	....	....	(2)	....	(2)	....	....
	1906	1	....	....	(2)	....	(2)	....	....
	1905	1	....	....	(2)	....	(2)	....	....
	1904	1	....	....	(2)	....	(2)	....	....
	1903	1	....	....	(2)	....	(2)	....	....
Union of South Africa	[44] 1919	5,575	....	721	28,492	5,842	695	81	499
	May 5, 1918	6,852	....	1,043	29,914	8,019	781	85	554
	1916	....	....	....	31,981	8,962	....	....	....
	Dec. 31, 1915	....	....	....	31,434	8,918	....	....	....
	Dec. 31, 1913	....	....	....	35,711	11,521	....	....	....
	1912	....	....	....	35,889	11,691	....	....	....
	1911	*5,797*	....	*1,082*	*30,657*	*11,763*	*719*	*94*	*337*
	[45] 1910	....	....	....	22,198	....	....	....	....
	1909	....	....	....	30,508	....	....	....	....
	1908	....	....	....	29,082	....	....	....	....
	[46] 1907	....	....	....	19,915	....	....	....	....
	[47] 1906	....	....	....	15,649	....	....	....	....
	1905	....	....	....	19,596	....	....	....	....
	1904	*3,500*	....	*679*	*16,328*	*9,771*	*450*	*185*	*142*
United Kingdom	June 4, 1920	11,770	....	3,113	23,407	....	1,883	....	....
	June 4, 1919	12,491	....	2,925	25,119	....	1,915	....	....
	June —, 1918	12,311	....	2,809	27,063	277	1,916	26	232
	1917	12,382	....	3,008	27,867	269	1,880	25	228
	1916	12,451	....	3,616	28,850	293	1,831	28	230
	1915	12,171	....	3,795	28,276	243	1,712	29	227
	1914	12,185	....	3,953	27,964	242	1,851	31	245
	1913	11,937	....	3,306	27,629	....	1,874	....	....
	1912	11,915	....	3,993	28,967	....	1,995	....	....
	1911	11,866	....	4,250	30,480	....	2,033	....	....
	1910	11,765	....	3,561	31,165	....	2,095	....	....
	1909	11,762	....	3,543	31,840	....	2,092	....	....
	1908	11,739	....	4,056	31,332	....	2,089	....	....
	1907	11,630	....	3,967	30,012	....	2,089	....	....
	1906	11,692	....	3,581	29,210	....	2,110	....	....
	1905	11,674	....	3,602	29,077	....	2,117	....	....
	1904	11,576	....	4,192	29,105	....	2,101	....	....
	1903	11,409	....	4,086	29,659	....	2,070	....	....
	1902	11,377	....	3,640	30,057	....	2,023	....	....
	1901	11,478	....	3,411	30,830	....	2,012	....	....

[2] Less than 500.
[41] Excludes territories of Mesopotamia, Palestine, Syria, and Arabia.
[42] Includes oxen.
[43] Includes Angora goats.
[44] Excluding native locations, reserves, etc.
[45] Cape of Good Hope and Transvaal only.
[46] Orange Free State excluded.
[47] Natal and Cape of Good Hope.

LIVE STOCK, ALL CLASSES—Continued.

TABLE 229.—*Live stock in principal and other countries*—Continued.

PRINCIPAL COUNTRIES—Continued.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
		Thousands.	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*	*Thousands.*
United Kingdom (con.)	1900	11,455	....	3,664	31,055	....	2,000	....	....
	1895	10,753	....	4,239	29,773	....	2,112	....	....
	1890	10,789	....	4,362	31,667	....	1,965	....	....
	1885	10,869	....	3,687	30,086	....	1,909	....	....
Uganda Protectorate.[49]	1917	665	....	....	215	....	(2)	....	....
	1916	683	....	....	263	....	(2)	....	....
	1915	700	....	....	262	....	(2)	....	....
	1914	845	....	....	578	....	(2)	....	....
	1913	775	....	....	537	....	(2)	....	....
	1912	739	....	....	579	....	(2)	....	....
	1911	759	....	....	861	....	(2)	....	....
	1910	516	....	....	522	....	(2)	....	....
	1909	336	....	1	533	....	(2)	....	....
	1908	428	....	1	560	....	(2)	....	....
	1907	379	....	1	458	....	....	....	....
	1906	....	....	....	....	....	....	....	....
	1905	....	....	3	....	....	....	....	....
Uruguay	*Apr. 20, 1916*	*7,803*	....	*304*	*11,473*	*12*	*555*	*14*	*8*
	1908	*8,193*	....	*180*	*26,286*	*20*	*556*	*18*	....
	1900	*6,827*	....	*94*	*18,609*	*20*	*561*	*23*	
	1860	*3,632*	....	*6*	*1,990*	*5*	*518*	*8*	

OTHER COUNTRIES.

Country.	Date.	Cattle.	Buffaloes.	Swine.	Sheep.	Goats.	Horses.	Mules.	Asses.
Azores, and Madeira Islands	1900	89	....	93	87	38	2	3	9
Bolivia	[3] 1912	734	....	114	1,499	468	99	45	173
Colombia	1915	3,035	....	711	164		526	201	139
Dominican Republic	....	200	....	....	50	550	80	....	....
Dominica (British)	1903	1	....	....	1	....	1	....	....
Dutch Guiana	....	....	....	....	....	....	....	....	....
Esthonia	[3] 1920	363	....	213	436	....	155	....	....
French Equatorial Africa	1918	400	....	150	1,000	1,500	20	....	10
French Guiana	1914	400	....	....	150	140	3	....	....
French Indo-China: Annam	1914	215	....	....	....	....	....	....	....
Cochin China	1914	109	242	709	3		....	....	....
Gambia	1907	83		....	....	....	4	....	....
Guam	1913	6		....	....	....	....	....	....
Ivory Coast (French)	*1918*	*53*	....	*11*	*126*	*168*	*1*	....	(2)
Jugo-Slavia	(1)	5,497	....	4,849	9,772	2,448	1,458		
Labrador	*1911*	(2)	....	(2)	....	....	....	....	....
Lithuania	[3] 1913	1,481	....	2,000	1,055		762	....	....
Monserrat (British)	1915	(2)	....	....	....	....	(2)	....	....
Nicaragua	1908	252	....	12	(2)	1	28	6	1
New Caledonia	(3)	130	....	25	25	25	....	....	....
Palestine	[3,50] 1920	....	....	....	250	320	....	....	....
Panama	1916	200	....	30	....	5	15	2	....
St. Croix	1918	9	....	....	....	....	....	....	....
St. Pierreet Miquelon	1918	(2)	....	(2)	....	....	(2)	....	(2)
Salvador	1906	284	....	423	21	....	74	....	....
Senegal	[3] 1919	417	....	....	....	....	....	....	....
Shetland Islands	1919	14	....	(2)	141	....	5	....	....
Siam	Jan 1, 1916	2,337	2,120	....	....	....	105	....	....
Southwest Africa Protectorate (former German Southwest Africa)	[3] 1914	239	....	....	....	....	17	....	....
Tanganijika Territory (former German East Africa)	[4] 1912	3,994	....	....	6,440		....	....	....
Upper Senegal and Niger (French)	July —, 1918	1,299	....	1	2,161	2,368	68	(2)	134
Venezuela	1912	2,004	....	1,618	177	1,667	191	89	313

[2] Less than 500.
[3] Unofficial estimate.
[49] Exclusive of horned cattle and sheep in certain provinces and districts.
[50] Iu occupied territory.

HIDES AND SKINS.

TABLE 230.—*Hides and skins: International trade, calendar years 1909–1919.*[1]

GENERAL NOTE.—Substantially the international trade of the world. It should not be expected that the world export and import totals for any year will agree. Among sources of disagreement are these: (1) Different periods of time covered in the "year" of various countries; (2) imports received in year subsequent to year of exports; (3) want of uniformity in classification of goods among countries; (4) different practices and varying degrees of failure in recording countries of origin and ultimate destination; (5) different practices of recording reexported goods; (6) opposite methods of treating free ports; (7) clerical errors, which, it may be assumed, are not infrequent.

The exports given are domestic exports and the imports given are imports for consumption as far as it is feasible and consistent so to express the facts. While there are some inevitable omissions, on the other hand there are some duplications because of reshipments that do not appear as such in official reports. For the United Kingdom import figures refer to imports for consumption, when available; otherwise total imports, less exports, of "foreign and colonial merchandise." Figures for the United States include Alaska, Porto Rico, and Hawaii.

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Argentina	293,950	212,106	259,906	271,817	257,655	241,381	....
Austria-Hungary	79,265						
Belgium	117,213	....	....	....	....	....	11,299
Brazil	83,252	74,782	109,163	124,631	93,863	104,995	134,964
British India	169,857	150,247	137,417	158,963	130,497	80,524	196,280
British South Africa	51,159	53,609	61,814	59,790	48,462	45,578	73,475
Canada	45,469	52,537	42,000	36,000	36,000	19,000	46,000
China	72,751	78,272	84,147	98,692	107,710	85,893	94,707
Chosen (Korea)	4,944	5,628					
Cuba	14,293	14,458	16,539	17,151	30,183	28,454	....
Denmark	21,998	20,897	11,466	8,202	5,333	7,409	....
Dutch East Indies	16,708	11,609	15,577	20,711	17,059	9,360	....
Egypt	10,754	9,094	7,673	7,554	8,664	6,386	8,556
France	131,041	95,739	59,030	25,599	20,312	4,379	53,883
Germany	152,373	....	....	....	....	....	....
Italy	48,428	43,691	18,580	7,010	928	308	6,219
Mexico	41,012	....	....	....	....	....	....
Netherlands	67,636	46,458	14,480	25,599	3,472	1,625	48,516
New Zealand	25,577	5,130	6,010	6,359	22,629	31,742	....
Peru	6,195	5,928	6,302	6,884	7,083	3,824	7,778
Russia	96,351	65,233	14,695	10,086	....	....	....
Singapore	6,435	5,184	....	....	....	....	....
Spain	17,457	12,294	8,187	11,119	11,001	4,843	14,807
Sweden	24,130	27,356	12,856	11,621	74	40	3,308
Switzerland	22,866	16,196	14,671	6,076	1,740	21	4,324
United Kingdom	38,100	32,227	20,600	33,570	11,239	2,364	7,393
United States	25,432	21,528	22,431	15,032	11,392	5,105	24,924
Uruguay	71,105	49,668	73,429	67,256	69,117	....	....
Venezuela	9,761	8,990	9,715	9,830	10,521	5,032	....
Other countries	225,840	229,823	160,764	139,261	129,673	50,026	....
Total	1,991,355	1,348,684	1,187,452	1,178,243	1,034,807	738,289	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	87,566	....	....	....	....	....	....
Belgium	180,930	....	....	....	....	....	31,765
British India	20,376	20,557	14,021	17,144	14,439	12,944	14,610
Canada	46,820	50,782	60,297	47,135	31,872	17,640	37,543
Denmark	9,812	9,221	6,556	5,312	3,554	332	....
Finland	10,717	5,617	11,800	8,254	....	....	....
France	155,508	113,592	51,029	77,933	116,921	44,433	152,323
Germany	440,200	....	....	....	....	....	....
Greece	5,770	4,086	2,151	2,300	2,339	....	....
Italy	53,524	39,828	82,290	78,006	39,866	68,465	92,821
Japan	6,321	6,520	15,536	19,454	12,535	21,789	....
Netherlands	73,691	54,744	23,381	14,007	5,514	852	31,483
Norway	13,979	11,107	11,359	9,849	5,687	1,165	....
Portugal	6,801	4,508	7,817	9,242	7,335	....	....
Rumania	7,223	1,241	....	....	....	....	....
Russia	110,143	84,623	13,644	430	....	....	....
Singapore	9,332	8,942	....	....	....	....	....
Spain	19,119	11,977	28,192	21,736	25,490	25,191	35,077
Sweden	25,662	21,358	25,387	11,860	2,221	5,391	26,701
United Kingdom	107,350	127,571	181,688	132,916	185,840	189,052	119,519
United States	511,249	556,195	646,271	726,310	631,066	361,891	711,836
Other countries	54,395	31,179	24,122	11,832	9,949	13,513	....
Total	1,959,521	1,163,648	1,205,541	1,193,720	1,094,628	762,658	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

MEAT AND MEAT PRODUCTS.

TABLE 231.—*Meat and meat products: International trade, calendar years 1911–1919.*

EXPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Argentina:							
Beef	940, 300	939, 809	915, 072	1, 059, 051	1, 067, 680	1, 361, 499	1, 115, 391
Mutton	148, 457	129, 384	77, 250	113, 136	87, 787	111, 145	125, 131
Pork	9	779	2, 304	3, 381	4, 031	3, 669	15, 797
Other	84, 695	80, 284	111, 030	150, 535	266, 054	484, 186	340, 385
Total	1, 173, 461	1, 150, 256	1, 105, 656	1, 326, 103	1, 425, 555	1, 960, 499	1, 596, 701
Australia:							
Beef	301, 882	419, 326	146, 863	307, 545	222, 814	221, 384	....
Mutton	149, 958	193, 264	38, 344	66, 813	19, 175	59, 687	....
Pork	6, 294	2, 755	902	2, 720	6, 796	12, 493	....
Other	49, 009	71, 266	18, 431	33, 472	51, 808	76, 722	....
Total	507, 143	686, 611	204, 540	410, 550	300, 593	370, 286	....
Belgium:							
Beef	1, 577	....	....	....	....	....	14, 906
Pork	16, 254	....	....	....	....	....	45, 164
Other	109, 226	....	....	....	....	....	53, 177
Total	127, 057	....	....	....	....	....	113, 247
Brazil:							
Beef	171	683	23, 764	91, 077	191, 163	145, 231	146, 326
Pork	278	3	11	8	22, 667	29, 606	46, 345
Other	1, 071	1, 181	1, 635	3, 299	16, 125	40, 103	58, 521
Total	1, 520	1, 867	25, 410	94, 384	229, 955	214, 940	251, 192
British South Africa:							
Beef	315	899	6, 605	17, 891	47, 459	18, 703	44, 656
Mutton	75	112	323	1	2	(1)	46
Pork	30	26	49	88	134	250	1, 566
Other	117	38	139	161	185	190	213
Total	537	1, 075	7, 116	18, 141	47, 780	19, 143	46, 481
Canada:							
Beef	6, 448	19, 039	30, 695	46, 129	84, 387	126, 695	120, 495
Mutton	48	1, 056	83	188	844	731	4, 939
Pork	47, 694	80, 168	156, 556	211, 616	233, 742	158, 488	263, 277
Other	6, 052	9, 819	16, 361	10, 785	18, 886	16, 450	21, 770
Total	60, 242	110, 082	203, 695	268, 718	337, 859	302, 364	410, 481
China:							
Beef	8, 787	18, 538	15, 151	40, 800	36, 961	18, 763	16, 716
Pork	7, 679	11, 308	12, 785	14, 066	23, 778	20, 036	45, 509
Other	48, 218	25, 255	31, 302	46, 227	62, 437	50, 396	85, 863
Total	64, 684	55, 101	59, 238	101, 093	123, 176	89, 195	148, 088
Denmark:							
Beef	43, 485	43, 400	72, 509	41, 800	40, 352	31, 069	....
Mutton	344	209	810	365	(1)	1	....
Pork	298, 086	363, 955	322, 983	245, 354	187, 739	6, 245	....
Other	26, 273	41, 774	56, 845	62, 335	51, 258	23, 501	....
Total	368, 188	449, 338	453, 147	349, 854	279, 349	60, 816	....
France:							
Beef	62, 361	42, 781	22, 290	20, 373	7, 726	2, 274	8, 699
Mutton	334	247	232	229	132	114	134
Pork	24, 668	16, 437	3, 243	2, 291	2, 216	963	42, 241
Other	10, 918	9, 287	7, 018	8, 540	5, 346	5, 297	21, 445
Total	98, 281	68, 752	32, 783	31, 433	15, 420	8, 648	72, 519

[1] Less than 500.

MEAT AND MEAT PRODUCTS—Continued.

TABLE 231.—*Meat and meat products: International trade, calendar years 1911–1919*—Continued.

EXPORTS—Continued.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Netherlands:							
Beef	326,176	348,718	446,395	403,414	6,202	440	42,364
Mutton	17,212	19,894	25,150	4,857	4,125	2	5,286
Pork	139,916	198,420	144,550	96,015	34,747	176	37,663
Other	14,098	16,212	18,049	22,762	14,670	1,830	14,451
Total	497,402	583,244	634,144	527,048	59,744	2,448	99,764
New Zealand:							
Beef	80,543	125,530	146,851	162,720	128,640	119,640	....
Mutton	235,509	280,324	302,218	251,245	169,644	139,575	....
Pork	1,049	605	1,363	1,179	2,123	608	....
Other	9,438	10,739	15,019	12,833	10,928	12,706	....
Total	326,539	417,198	465,451	427,977	311,335	272,529	....
Russia: [2]							
Beef	32	72	1,047	....	....	....	....
Mutton	365	105	125	....	....	....	....
Pork	28,871	19,515	5,704	1,011	....	....	....
Other	23,907	13,326	3,206	4,406	....	....	....
Total	53,175	33,018	10,082	5,417	....	....	....
Sweden:							
Beef	17,285	18,377	35,035	10,952	10,967	56	3,861
Mutton	100	152	54	2	5	1	....
Pork	19,445	33,618	42,518	32,190	10,507	8	9,146
Other	2,938	5,590	11,625	4,646	2,684	437	5,028
Total	39,768	57,737	89,232	47,790	24,163	502	18,035
United Kingdom:							
Beef	27,595	22,415	19,551	10,790	2,837	1,983	....
Pork	15,820	12,759	13,842	10,886	1,607	202	1,114
Other	73,811	101,917	89,917	59,330	84,312	11,402	73,929
Total	117,226	137,091	123,310	81,006	88,756	13,587	75,043
United States:							
Beef	213,722	186,593	534,766	391,442	402,430	792,793	429,432
Mutton	4,146	3,847	4,231	5,258	2,862	1,631	3,009
Pork	1,019,561	828,290	1,371,100	1,453,966	1,299,556	2,251,033	2,638,721
Other	40,095	30,526	41,829	19,490	25,753	16,416	47,566
Total	1,277,524	1,049,256	1,951,926	1,870,156	1,730,601	3,061,873	3,118,728
Uruguay:							
Beef	119,675	200,977	248,795	179,197	210,766	....	....
Mutton	3,262	5,356	7,806	8,088	4,589	....	....
Pork	3	2	1	(1)	63	....	....
Other	73,971	30,437	49,537	60,448	105,675	....	....
Total	196,911	236,772	306,139	247,733	321,093	....	....
Other countries:							
Beef	11,982	8,041	6,380	6,642	4,174	2,549	....
Mutton	474	18	....	1	23	1	....
Pork	12,488	5,379	7,433	6,671	4,758	4,970	....
Other	90,054	71,377	154,092	97,123	99,716	42,490	....
Total	114,998	84,815	167,905	110,437	108,671	50,010	....
All countries:							
Beef	2,162,336	2,395,198	2,671,769	2,789,823	2,464,558	2,843,079	....
Mutton	560,284	633,968	456,625	450,182	289,188	312,888	....
Pork	1,638,145	1,574,019	2,085,344	2,081,442	1,834,467	2,488,747	....
Other	663,891	519,028	626,036	596,392	815,837	782,126	....
Total	5,024,656	5,122,213	5,839,774	5,917,840	5,404,050	6,426,840	....

[1] Less than 500.

[2] For 1916, exports over European frontier only.

MEAT AND MEAT PRODUCTS—Continued.

TABLE 231.—*Meat and meat products: International trade, calendar years 1911–1919*—Continued.

IMPORTS.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
Into—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Austria-Hungary:							
Beef	12,983	....	....	....	....	....	....
Pork	14,338	....	....	....	....	....	....
Other	21,947	....	....	....	....	....	....
Total	49,268	....	....	....	....	....	....
Belgium:							
Beef	6,034	....	....	....	....	....	20,560
Pork	22,232	....	....	....	....	....	19,767
Other	150,854	....	....	....	....	....	116,106
Total	179,120	....	....	....	....	....	156,433
Brazil:							
Beef	48,989	11,823	17,117	3,541	4,190	7,781	2,979
Pork	3,767	2,148	1,477	1,101	347	63	101
Other	1,256	610	214	124	51	75	114
Total	54,012	14,581	18,808	4,766	4,588	7,919	3,194
British South Africa:							
Beef	17,683	11,366	8,667	5,405	1,655	4,717	3,298
Mutton	1,914	162	24	10	20	1	175
Pork	8,249	7,034	6,384	4,886	978	203	119
Other	4,633	3,425	2,455	2,381	2,418	2,254	2,835
Total	32,479	21,987	17,530	12,682	5,071	7,175	6,427
Canada:							
Beef	3,091	3,532	5,623	9,783	19,434	9,540	7,246
Mutton	4,717	4,194	2,906	2,786	2,008	5,311	4,746
Pork	29,189	13,001	25,279	94,113	128,093	16,170	59,260
Other	6,330	4,212	3,869	42,492	28,101	2,155	3,590
Total	43,327	24,939	37,677	149,174	177,636	33,176	74,842
Cuba:							
Beef	37,822	27,760	22,655	42,271	39,800	24,347	....
Mutton	41	52	56	13	22	81	....
Pork	85,973	89,195	96,805	104,444	86,454	98,866	....
Other	4,526	3,981	4,862	6,439	6,898	7,812	....
Total	128,362	120,988	124,378	153,167	133,174	131,106	....
France:							
Beef	41,318	71,796	404,780	497,251	457,969	492,760	632,379
Mutton	930	6,346	20,409	29,309	35,172	29,944	63,448
Pork	59,824	33,994	86,986	111,448	159,919	165,846	457,709
Other	9,424	11,225	41,045	65,048	51,823	74,009	129,852
Total	111,496	123,361	553,220	703,056	704,883	762,559	1,283,388
Germany:							
Beef	212,150	....	....	....	....	....	....
Mutton	1,046	....	....	....	....	....	....
Pork	265,669	....	....	....	....	....	....
Other	80,887	....	....	....	....	....	....
Total	559,752	....	....	....	....	....	....
Italy:							
Beef	131	108	215	262	97	(1)	1,316
Pork	74,861	10,381	15,238	8,894	29,883	89,889	143,921
Other	29,627	63,036	143,075	272,425	259,663	401,992	380,203
Total	104,619	73,525	158,528	281,581	289,643	491,881	525,440
Netherlands:							
Beef and veal	256,296	203,057	187,097	81,379	23,750	776	77,972
Mutton	76	49	10	40	2,985	13	1,224
Pork	88,143	41,904	51,255	31,217	3,286	60	78,723
Other	15,349	14,043	8,697	3,067	62	86	11,780
Total	359,864	259,053	247,059	115,703	30,083	935	169,699

1 Less than 500.

MEAT AND MEAT PRODUCTS—Continued.

TABLE 231.—*Meat and meat products: International trade; calendar years 1911–1919*—Continued.

IMPORTS—Continued.

Country.	Average, 1911–1913.	1914	1915	1916	1917	1918	1919
Into—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Norway:							
Beef	20,203	21,098	26,601	30,797	26,374	1,530	....
Pork	9,751	11,173	11,349	18,522	16,427	4,456	....
Other	12,462	14,219	5,047	7,223	27,738	21,668	....
Total	42,416	46,490	42,997	56,542	70,539	27,654	....
Russia:[1]							
Beef	2,216	693	78	347	....	....	....
Other	128,681	97,557	32,634	3,582	....	....	....
Total	130,897	98,250	32,712	3,929	....	....	....
Spain:							
Beef	966	24	80	160	167	81	19
Pork	553	368	1,760	5,881	1,050	56	737
Other	36,455	34,527	29,478	24,457	24,917	12,459	17,839
Total	37,974	34,919	31,318	30,498	26,134	12,596	18,595
Sweden:							
Beef	12,912	17,312	19,202	15,877	1,621	12,260	14,294
Mutton	1,218	521	116	26	3	37	....
Pork	6,736	6,069	9,833	6,572	14,683	1,738	67,929
Other	3,349	3,619	6,787	2,542	1,392	4,845	22,946
Total	24,215	27,521	35,938	25,017	17,699	18,880	105,169
Switzerland:							
Beef	9,052	4,544	9,264	6,354	4,326	5,978	7,957
Pork	21,976	11,034	8,765	6,647	8,928	14,379	27,959
Other	29,146	14,579	9,264	10,258	6,319	6,632	11,2[illegible]9
Total	60,174	30,157	24,019	23,259	19,573	26,989	47,125
United Kingdom:							
Beef	1,252,292	1,302,570	1,523,908	1,391,017	1,180,013	1,296,341	1,222,101
Mutton	596,899	577,339	527,517	406,814	292,922	237,862	478,987
Pork	875,929	957,327	1,139,805	1,225,134	1,047,118	1,656,084	1,259,829
Other	118,485	126,131	130,122	111,131	110,293	110,267	134,304
Total	2,843,605	2,963,367	3,321,352	3,134,096	2,630,346	3,300,554	3,095,221
United States:							
Beef	17,668	258,349	120,308	40,421	27,627	30,291	52,916
Mutton	185	19,876	11,879	17,235	5,624	608	8,209
Pork	171	26,835	5,496	1,171	2,821	3,585	5,426
Other	695	499	98	4	13	6	41,092
Total	18,719	305,559	137,781	58,831	36,085	34,490	107,643
Other countries:							
Beef	92,366	79,786	84,822	56,684	52,589	43,808	....
Mutton	4,718	3,558	1,632	635	128	136	....
Pork	65,021	37,474	58,837	36,652	25,059	15,602	....
Other	47,966	34,356	50,108	90,201	64,956	60,475	....
Total	210,071	155,174	195,399	184,172	142,732	120,021	....
All countries:[2]							
Beef	2,044,172	2,013,818	2,427,143	2,181,549	1,839,612	1,930,210	....
Mutton	611,744	612,097	564,549	456,868	338,884	273,993	....
Pork	1,632,382	1,247,937	1,519,269	1,656,682	1,525,046	2,066,997	....
Other	702,072	426,019	467,755	641,374	584,644	704,735	....
Total	4,990,370	4,299,871	4,978,716	4,936,473	4,288,186	4,975,935	....

[1] 1916 figures are for over European frontier only.
[2] Does not include imports into Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

HORSES AND MULES.

TABLE 232.—*Horses and mules: Number and value on farms in the United States, 1867–1921.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of numbers are obtained by applying estimated percentages of increase or decrease to the published numbers of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available. It should also be observed that the census of 1910, giving numbers as of Apr. 15, is not strictly comparable with former censuses, which related to numbers June 1.

Jan. 1—	Horses.			Mules.		
	Number.	Price per head Jan. 1.	Farm value Jan. 1.	Number.	Price per head Jan. 1.	Farm value Jan. 1.
1867	5,401,000	$59.05	$318,924,000	822,000	$66.94	$55,048,000
1868	5,757,000	54.27	312,416,000	856,000	56.04	17,954,000
1869	6,333,000	62.57	396,222,000	922,000	79.23	73,027,000
1870	8,249,000	67.43	556,251,000	1,180,000	90.42	106,654,000
1870, census, June 1	*7,145,370*			*1,125,415*		
1871	8,702,000	71.14	619,039,000	1,242,000	91.98	114,272,000
1872	8,991,000	67.41	606,111,000	1,276,000	87.14	111,222,000
1873	9,222,000	66.39	612,2[illegible]3,000	1,310,000	85.15	111,546,000
1874	9,334,000	65.15	608,073,000	1,339,000	81.35	108,953,000
1875	9,504,000	61.10	580,708,000	1,394,000	71.89	100,197,000
1876	9,935,000	57.29	557,747,000	1,414,000	66.46	94,001,000
1877	10,155,000	55.83	567,017,000	1,444,000	64.07	92,482,000
1878	10,330,000	56.63	584,999,000	1,638,000	62.03	101,579,000
1879	10,939,000	52.36	572,712,000	1,713,000	56.00	95,942,000
1880	11,202,000	54.75	613,297,000	1,730,000	61.26	105,948,000
1880, census, June 1	*10,357,488*			*1,812,808*		
1881	11,430,000	58.44	667,954,000	1,721,000	69.79	120,096,000
1882	10,522,000	58.53	615,825,000	1,835,000	71.35	130,945,000
1883	10,838,000	70.59	765,041,000	1,871,000	79.49	148,732,000
1884	11,170,000	74.64	833,734,000	1,914,000	84.22	161,215,000
1885	11,565,000	73.70	852,283,000	1,973,000	82.38	162,497,000
1886	12,078,000	71.27	860,823,000	2,053,000	79.60	163,381,000
1887	12,497,000	72.15	901,686,000	2,117,000	78.91	167,058,000
1888	13,173,000	71.82	946,096,000	2,192,000	79.78	174,854,000
1889	13,663,000	71.89	982,195,000	2,258,000	79.49	179,444,000
1890	14,214,000	68.84	978,517,000	2,331,000	78.25	182,394,000
1890, census, June 1	*14,969,467*			*2,295,532*		
1891	14,057,000	67.00	941,823,000	2,297,000	77.88	178,847,000
1892	15,498,000	65.01	1,007,594,000	2,315,000	75.55	174,882,000
1893	16,207,000	61.22	992,225,000	2,331,000	70.68	164,764,000
1894	16,081,000	47.83	769,225,000	2,352,000	62.17	146,233,000
1895	15,893,000	36.29	576,731,000	2,333,000	47.55	110,928,000
1896	15,124,000	33.07	500,140,000	2,279,000	45.29	103,204,000
1897	14,365,000	31.51	452,649,000	2,216,000	41.66	92,302,000
1898	13,961,000	34.26	478,362,000	2,190,000	43.88	96,110,000
1899	13,665,000	37.40	511,075,000	2,134,000	44.96	95,963,000
1900	13,538,000	44.61	603,969,000	2,086,000	53.55	111,717,000
1900, census, June 1	*18,267,020*			*3,264,615*		
1901 [1]	16,745,000	52.86	885,200,000	2,864,000	63.97	183,232,000
1902	16,531,000	58.61	968,935,000	2,757,000	67.61	186,412,000
1903	16,557,000	62.25	1,030,706,000	2,728,000	72.49	197,753,000
1904	16,736,000	67.93	1,136,940,000	2,758,000	78.88	217,533,000
1905	17,058,000	70.37	1,200,310,000	2,889,000	87.18	251,840,000
1906	18,719,000	80.72	1,510,890,000	3,404,000	98.31	334,681,000
1907	19,747,000	93.51	1,846,578,000	3,817,000	112.16	428,064,000
1908	19,992,000	93.41	1,867,530,000	3,869,000	107.76	416,939,000
1909	20,640,000	95.64	1,974,052,000	4,053,000	107.84	437,082,000
1910	21,040,000			4,123,000		
1910, census, Apr. 15	*19,833,113*	108.03	2,142,524,000	*4,209,769*	120.20	506,049,000
1911 [1]	20,277,000	111.46	2,259,981,000	4,323,000	125.92	544,359,000
1912	20,509,000	105.94	2,172,694,000	4,362,000	120.51	525,657,000
1913	20,567,000	110.77	2,278,222,000	4,386,000	124.31	545,245,000
1914	20,962,000	109.32	2,291,638,000	4,449,000	123.85	551,017,000
1915	21,195,000	103.33	2,190,102,000	4,479,000	112.36	503,271,000
1916	21,159,000	101.60	2,149,786,000	4,593,000	113.83	522,834,000
1917	21,210,000	102.89	2,182,307,000	4,723,000	118.15	558,006,000
1918	21,555,000	104.24	2,246,970,000	4,873,000	128.81	627,679,000
1919	21,482,000	98.45	2,114,897,000	4,954,000	135.83	672,922,000
1920	20,785,000	94.42	1,962,503,000	5,041,000	147.07	741,400,000
1921	20,183,000	82.45	1,664,166,000	4,999,000	115.72	578,473,000

[1] Estimates of numbers revised, based on census data.

HORSES AND MULES—Continued.

TABLE 233.—*Horses and mules: Number and value on farms, Jan. 1, 1920 and 1921, by States.*

State.	Horses.						Mules.					
	Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—		Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—	
	1921	1920	1921	1920	1921	1920	1921	1920	1921	1920	1921	1920
Maine	104	105	$141.00	$154.00	$14,976	$16,170						
New Hampshire	39	40	132.00	144.00	5,148	5,760						
Vermont	84	84	122.00	141.00	10,248	11,844						
Massachusetts	47	50	150.00	155.00	7,050	7,750						
Rhode Island	7	7	149.00	160.00	1,043	1,120						
Connecticut	39	41	146.00	165.00	5,694	6,765						
New York	543	560	127.00	141.00	68,961	78,960	7	7	$135.00	$148.00	$945	$1,036
New Jersey	87	88	141.00	150.00	12,267	13,200	5	5	160.00	171.00	800	855
Pennsylvania	549	560	118.00	123.00	64,782	68,880	45	46	141.00	141.00	6,345	6,486
Delaware	33	34	77.00	83.00	2,541	2,822	6	6	110.00	111.00	660	666
Maryland	158	165	95.00	102.00	15,010	16,830	25	25	124.00	134.00	3,100	3,350
Virginia	351	362	96.00	108.00	33,696	39,096	65	65	126.00	136.00	8,190	8,840
West Virginia	184	190	98.00	104.00	18,032	19,760	13	13	114.00	121.00	1,482	1,573
North Carolina	179	183	122.00	153.00	21,838	27,999	231	236	154.00	190.00	35,574	44,840
South Carolina	79	80	134.00	180.00	10,586	14,400	217	215	186.00	231.00	40,362	49,665
Georgia	132	132	112.00	159.00	14,784	20,988	347	351	153.00	216.00	53,091	75,816
Florida	58	60	123.00	140.00	7,134	8,400	40	40	167.00	196.00	6,680	7,840
Ohio	795	811	104.00	109.00	82,680	88,399	28	28	113.00	120.00	3,164	3,360
Indiana	788	804	91.00	101.00	71,708	81,204	93	95	112.00	128.00	10,416	12,160
Illinois	1,324	1,394	82.00	94.00	108,568	131,036	146	147	102.00	125.00	14,892	18,375
Michigan	614	640	93.00	95.00	57,102	60,800	4	4	96.00	99.00	384	396
Wisconsin	674	680	103.00	109.00	69,422	74,120	3	3	99.00	112.00	297	336
Minnesota	920	940	83.00	91.00	76,360	85,540	6	6	93.00	99.00	558	594
Iowa	1,328	1,398	81.00	89.00	107,568	124,422	71	71	108.00	121.00	7,668	8,591
Missouri	1,030	1,040	71.00	83.00	73,130	86,320	367	378	95.00	120.00	34,865	45,360
North Dakota	800	825	62.00	81.00	49,600	66,825	9	9	85.00	98.00	765	882
South Dakota	786	819	61.00	71.00	47,946	58,149	14	15	82.00	94.00	1,148	1,410
Nebraska	965	995	69.00	75.00	66,585	74,625	99	106	92.00	109.00	9,108	11,554
Kansas	1,108	1,153	66.00	79.00	73,128	91,087	250	260	90.00	117.00	22,500	30,420
Kentucky	420	429	84.00	101.00	35,280	43,329	250	250	107.00	126.00	26,750	31,500
Tennessee	338	345	90.00	113.00	30,420	38,985	277	280	108.00	139.00	29,916	38,920
Alabama	158	158	89.00	128.00	14,062	20,224	322	316	112.00	171.00	36,064	54,036
Mississippi	256	261	87.00	113.00	22,272	29,493	312	322	119.00	152.00	37,128	48,944
Louisiana	211	215	84.00	107.00	17,724	23,005	166	166	140.00	164.00	23,240	27,224
Texas	1,187	1,199	75.00	96.00	89,025	115,104	792	784	107.00	140.00	84,744	109,760
Oklahoma	667	710	63.00	83.00	42,021	58,930	292	295	89.00	120.00	25,988	35,400
Arkansas	258	266	75.00	97.00	19,350	25,802	327	324	105.00	132.00	34,335	42,768
Montana	520	520	49.00	60.00	25,480	31,200	5	5	76.00	80.00	380	400
Wyoming	189	210	46.00	53.00	8,694	11,130	4	4	77.00	90.00	308	360
Colorado	408	421	62.00	79.00	25,296	33,259	30	31	89.00	101.00	2,670	3,131
New Mexico	225	232	58.00	68.00	13,050	15,776	21	20	88.00	104.00	1,848	2,080
Arizona	120	120	85.00	70.00	10,200	8,400	12	12	124.00	106.00	1,488	1,272
Utah	145	145	75.00	78.00	10,875	11,310	3	3	71.00	73.00	213	219
Nevada	74	75	57.00	60.00	4,218	4,500	3	3	64.00	64.00	192	192
Idaho	262	270	68.00	77.00	17,816	20,790	5	5	76.00	91.00	380	455
Washington	284	290	80.00	92.00	22,720	26,680	20	21	90.00	106.00	1,800	2,226
Oregon	276	279	81.00	85.00	22,356	23,715	10	10	91.00	91.00	910	910
California	380	400	94.00	94.00	35,720	37,600	57	59	125.00	122.00	7,125	7,198
United States	20,183	20,785	82.45	94.42	1,664,166	1,962,503	4,999	5,041	115.72	147.07	578,473	741,400

HORSES AND MULES—Continued.

TABLE 234.—*Prices of horses and mules at St. Louis, 1900–1920.*

[Compiled from commercial papers.]

Year and month.	Horses good to choice, draft.		Mules 16 to 16½ hands.	
	Low.	High.	Low.	High.
1900	$140.00	$190.00	$90.00	$150.00
1901	150.00	175.00	110.00	165.00
1902	160.00	185.00	120.00	160.00
1903	160.00	185.00	120.00	175.00
1904	175.00	200.00	135.00	200.00
1905	175.00	225.00	120.00	210.00
1906	175.00	225.00	125.00	215.00
1907	175.00	225.00	125.00	250.00
1908	175.00	250.00	125.00	200.00
1909	140.00	225.00	130.00	225.00
1910	165.00	240.00	150.00	275.00
1911	165.00	235.00	150.00	275.00
1912	165.00	240.00	160.00	285.00
1913	200.00	250.00	160.00	280.00
1914	175.00	220.00	120.00	250.00
1915	160.00	225.00	120.00	275.00
1916	150.00	225.00	135.00	275.00
1917	165.00	245.00	172.00	272.00
1918	199.00	242.00	201.00	307.00
1919.				
January	150.00	180.00	200.00	325.00
February	150.00	180.00	200.00	325.00
March	150.00	180.00	200.00	325.00
April	150.00	270.00	150.00	400.00
May	150.00	270.00	150.00	350.00
June	$150.00	$325.00	$200.00	$350.00
July	150.00	300.00	200.00	350.00
August	150.00	300.00	200.00	350.00
September	145.00	300.00	200.00	350.00
October	145.00	300.00	200.00	350.00
November	145.00	255.00	200.00	350.00
December	140.00	250.00	190.00	350.00
Year 1919	140.00	325.00	150.00	400.00
1920.				
January	140.00	255.00	190.00	400.00
February	150.00	255.00	200.00	400.00
March	150.00	275.00	200.00	400.00
April	150.00	275.00	200.00	400.00
May	140.00	275.00	175.00	400.00
June	115.00	255.00	165.00	370.00
July	200.00	265.00	165.00	370.00
August	175.00	265.00	155.00	370.00
September	150.00	240.00	150.00	360.00
October	150.00	200.00	140.00	350.00
November	110.00	200.00	....	....
December	110.00	200.00	....	....
Year 1920	110.00	275.00	140.00	400.00

TABLE 235.—*Horses: Farm price per head, 15th of each month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$118	$120	$130	$129	$128	$130	$137	$140	$134	$143	$131
Feb. 15	123	121	133	131	129	132	139	146	137	144	134
Mar. 15	127	124	137	133	131	132	138	146	140	145	135
Apr. 15	131	127	137	136	133	132	138	148	142	147	137
May 15	132	129	136	138	134	133	139	145	144	146	138
June 15	130	127	135	137	132	132	136	146	145	145	136
July 15	127	127	132	135	133	134	137	143	142	139	135
Aug. 15	124	125	131	132	131	131	135	141	142	141	133
Sept. 15	119	119	128	132	131	131	132	141	141	139	131
Oct. 15	112	114	126	130	130	129	131	138	140	137	129
Nov. 15	103	113	122	129	129	127	130	136	139	136	126
Dec. 15	97	113	121	129	129	126	130	135	139	134	125

HORSES AND MULES—Continued.

TABLE 236.—*Average price per head for horses on the Chicago market, 1902–1920.*

[Compiled from commercial papers.]

Year and month.	Drafters.	Carriage teams.	Drivers.	General.	Bussers, trammers.	Cavalry horses.[1]	Southern chunks.
1902	$166.00	$450.00	$145.00	$117.00	$135.00	$151.00	$57.00
1903	171.00	455.00	150.00	122.00	140.00	156.00	62.00
1904	177.00	475.00	150.00	140.00	140.00	160.00	64.00
1905	186.00	486.00	156.00	132.00	145.00	172.00	70.00
1906	188.00	486.00	158.00	154.00	147.00	174.00	72.50
1907	194.00	482.00	165.00	137.00	152.00	172.00	77.50
1908	180.00	450.00	156.00	129.00	138.00	164.00	69.00
1909	194.00	482.00	165.00	137.00	152.00	172.00	77.00
1910	200.00	473.00	172.00	144.00	161.00	177.00	87.00
1911	205.00	483.00	182.00	155.00	170.00	190.00	92.00
1912	210.00	473.00	177.00	160.00	175.00	195.00	97.00
1913	213.00	493.00	174.00	165.00	176.00	189.00	98.00
1914	208.00	483.00	169.00	160.00	171.00	184.00	93.00
1915	205.00	473.00	164.00	155.00	166.00	179.00	88.00
1916	252.00	....	166.00	160.00	167.00	124.00	109.00
1917	212.00	470.00	162.00	148.00	170.00	188.00	93.00
1918	220.00	....	....	....	....	....	....
1919.		(2)			(3)		
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	250.00	202.00	....	152.00	162.00	....	105.00
May	218.00	170.00	....	130.00	135.00	....	75.00
June	200.00	172.00	....	120.00	118.00	....	65.00
July	218.00	170.00	....	118.00	118.00	....	65.00
August	205.00	158.00	....	105.00	112.00	....	65.00
September	230.00	158.00	....	105.00	112.00	....	65.00
October	250.00	158.00	....	105.00	112.00	....	75.00
November	250.00	158.00	....	105.00	112.00	....	75.00
December	250.00	158.00	....	105.00	112.00	....	65.00
Year 1919	230.11	167.11	....	116.11	121.44	....	72.78
1920.			(4)	(5)			
January	282.50	180.00	195.00	177.50	127.50	....	90.00
February	279.24	177.83	192.28	177.50	127.50	....	90.00
March	275.74	166.67	178.00	169.00	123.67	....	86.50
April	271.43	173.93	172.14	170.60	122.14	....	84.64
May	275.00	177.50	175.00	180.00	112.50	....	....
June	226.82	155.57	138.86	140.45	92.50	....	....
July	224.09	166.59	136.82	144.32	92.27	....	....
August	223.35	165.69	136.25	143.75	91.94	....	....
September	215.00	157.50	130.00	137.50	90.00	....	....
October	212.50	157.50	130.00	137.50	90.00	....	....
November	210.23	157.50	130.00	137.96	90.00	....	....
December	212.50	....	130.00	137.96	90.00	....	....
Year 1920	212.37	166.94	153.70	154.45	101.17	....	87.78

[1] Saddlers prior to 1916.
[2] Expressers 1919–20.
[3] Farm chunks 1919–20.
[4] Drafters, plain to medium, 1920.
[5] Wagon horses, 1920.

HORSES AND MULES—Continued.

TABLE 237.—*Number of horses and mules received at principal live-stock markets, 1900–1920.*

[From reports of stockyards companies.]

Year and month.	Horses.		Horses and mules.						
	Chicago.	St. Paul.	Denver.	Fort Worth.	Kansas City.	Omaha.	St. Joseph.	St. Louis National Stock Yards, Ill.	Total, 8 cities.
1900	99,010	26,778	22,691	....	103,308	59,645	13,497	144,921	469,850
1901	109,353	15,123	16,545	....	96,657	36,391	22,521	128,880	425,470
1902	102,100	8,162	24,428	4,872	76,844	42,079	19,909	109,295	387,689
1903	100,603	7,823	19,040	10,094	67,274	52,829	20,483	128,615	406,761
1904	105,949	6,438	13,437	17,895	67,562	46,845	28,704	181,341	468,171
1905	127,250	5,561	16,046	18,033	65,582	45,422	31,565	178,257	487,716
1906	126,979	9,299	16,571	21,303	69,629	42,269	28,480	166,393	480,923
1907	102,055	14,557	11,059	18,507	62,341	44,020	26,894	117,379	396,812
1908	92,138	7,125	11,158	12,435	56,335	39,998	22,875	109,393	351,457
1909	91,411	5,632	15,348	20,732	67,796	31,711	23,132	122,471	378,233
1910	83,439	5,482	15,554	34,445	69,628	29,734	27,583	130,271	396,136
1911	104,545	7,709	18,022	37,361	84,861	31,771	42,023	170,379	496,671
1912	92,977	5,314	14,918	49,025	73,445	32,520	38,661	163,973	470,833
1913	90,615	5,203	16,274	56,724	82,110	31,580	32,418	156,825	471,749
1914	106,282	5,683	16,957	47,712	87,155	30,688	25,424	148,128	468,029
1915	165,253	10,091	71,870	53,640	102,153	41,679	41,254	270,612	756,552
1916	205,449	11,777	52,800	79,209	123,141	27,486	27,206	266,818	793,886
1917	107,311	9,959	19,758	115,233	127,823	32,781	33,584	279,837	726,286
1918	87,820	6,541	14,599	78,881	84,628	22,212	39,260	241,751	575,692
1919.									
January	3,855	194	1,379	6,329	7,858	719	4,611	25,471	50,416
February	3,738	257	1,396	5,367	7,274	700	3,944	20,316	42,992
March	5,174	449	1,459	3,897	5,727	948	2,673	15,395	35,722
April	4,246	281	850	3,031	4,854	619	1,407	11,066	26,354
May	3,720	147	932	1,930	3,261	393	342	6,697	17,422
June	3,636	878	604	1,916	2,686	2,485	1,984	11,328	25,517
July	3,048	1,071	1,420	1,208	4,062	3,828	4,030	15,535	34,202
August	2,787	1,539	1,399	4,575	7,923	4,354	3,958	22,487	49,022
September	4,504	2,822	1,996	6,283	11,323	6,087	5,940	38,418	77,373
October	2,949	1,300	3,570	7,916	9,349	2,811	6,649	33,433	67,977
November	4,732	1,728	4,370	11,144	11,656	1,497	4,620	31,204	70,951
December	45,762	11,228	22,936	60,363	82,852	25,201	43,380	250,211	541,933
Total, 1919	88,151	21,894	42,311	113,959	158,825	49,642	83,538	481,561	1,039,881
1920.									
January	3,870	685	3,400	11,492	14,075	2,522	6,064	32,712	74,820
February	5,526	781	1,842	9,461	15,331	2,292	4,407	23,625	63,265
March	7,410	1,204	2,267	6,087	8,082	2,472	3,326	17,215	48,063
April	2,865	430	1,511	1,309	2,962	1,773	2,869	8,524	22,243
May	5,468	271	1,369	1,027	3,447	764	1,339	5,596	19,281
June	3,093	370	1,311	407	3,345	1,052	1,228	6,366	17,172
July	2,296	1,936	1,054	568	3,134	1,253	2,256	8,893	21,390
August	3,625	1,730	1,278	5,206	9,537	2,712	3,430	14,880	42,398
September	2,639	1,765	1,624	4,280	5,855	2,159	3,106	10,466	31,894
October	2,019	704	916	2,610	4,063	1,116	1,292	7,075	19,795
November	2,309	340	656	1,909	1,284	399	319	2,782	9,998
December	1,900	272	363	1,006	682	237	132	3,096	7,688
Total 1920	43,020	10,488	17,591	45,362	71,797	18,751	29,768	141,230	378,007

HORSES AND MULES—Continued.

TABLE 238.—*Horses and mules: Imports, exports, and prices, 1896–1920.*

Year ending June 30—	Imports of horses.			Exports of horses.			Exports of mules.		
	Number.	Value.	Average import price.	Number.	Value.	Average export price.	Number.	Value.	Average export price.
1896	9,991	$662,591	$66.32	25,126	$3,530,703	$140.52	5,918	$406,161	$68.63
1897	6,998	464,808	66.42	39,532	4,769,265	120.64	7,473	545,331	72.97
1898	3,085	414,899	134.49	51,150	6,176,569	120.75	8,098	664,789	82.09
1899	3,042	551,050	181.15	45,778	5,444,342	118.93	6,755	516,908	76.52
1900	3,102	596,592	192.32	64,722	7,612,616	117.62	43,369	3,919,478	90.33
1901	3,785	985,738	260.43	82,250	8,873,845	107.89	34,405	3,210,267	93.30
1902	4,832	1,577,234	326.41	103,020	10,048,046	97.53	27,586	2,692,298	97.61
1903	4,999	1,536,296	307.32	34,007	3,152,159	92.69	4,294	521,725	121.47
1904	4,726	1,460,287	308.99	42,001	3,189,100	75.93	3,658	412,971	112.90
1905	5,180	1,591,083	307.16	34,822	3,175,259	91.19	5,826	645,464	110.79
1906	6,021	1,716,675	285.11	40,087	4,365,981	108.91	7,167	989,639	138.08
1907	6,080	1,978,105	325.35	33,882	4,359,957	131.99	6,781	850,901	125.48
1908	5,487	1,604,392	292.40	19,000	2,612,587	137.50	6,609	990,667	149.90
1909	7,084	2,007,276	283.35	21,616	3,386,617	156.67	3,432	472,017	137.53
1910	11,620	3,296,022	283.65	28,910	4,081,157	141.17	4,512	614,094	136.18
1911	9,593	2,692,074	280.63	25,145	3,845,253	152.92	6,585	1,070,051	163.50
1912	6,607	1,923,025	291.06	34,828	4,764,815	136.81	4,901	732,095	149.30
1913	10,008	2,125,875	212.42	28,707	3,960,102	137.95	4,744	733,795	154.68
1914	33,019	2,605,029	78.89	22,776	3,388,819	148.79	4,883	690,974	141.51
1915	12,652	977,380	77.25	289,340	64,046,534	221.35	65,788	12,726,143	193.44
1916	15,556	1,618,245	104.03	357,553	73,531,146	205.65	111,915	22,946,312	205.03
1917	12,584	1,888,303	150.06	278,674	59,525,329	213.60	136,689	27,800,854	203.39
1918	5,111	1,187,443	232.33	84,765	14,923,663	176.06	28,879	4,885,406	169.17
1919	4,003	750,264	187.43	27,975	5,206,251	186.10	12,452	2,333,929	187.43
1920	4,906	799,012	162.86	18,952	3,285,066	173.34	8,991	1,815,888	201.97

CATTLE.

TABLE 239.—*Cattle (live): Imports, exports, and prices, 1896–1920.*

Year ending June 30—	Imports.			Exports.		
	Number.	Value.	Average import price.	Number.	Value.	Average export price.
1896	217,826	$1,509,856	$6.93	372,461	$34,560,672	$92.79
1897	328,977	2,589,857	7.87	392,190	36,357,451	92.70
1898	291,589	2,913,223	9.99	439,255	37,827,500	86.12
1899	199,752	2,320,362	11.62	389,490	30,516,833	78.35
1900	181,006	2,257,694	12.47	397,286	30,635,153	77.11
1901	146,022	1,931,433	13.23	459,218	37,566,980	81.81
1902	96,027	1,608,722	16.75	392,884	29,902,212	76.11
1903	66,175	1,161,548	17.55	402,178	29,848,936	74.22
1904	16,056	310,737	19.35	593,409	42,256,291	71.21
1905	27,855	458,572	16.46	567,806	40,598,048	71.50
1906	29,019	548,430	18.90	584,239	42,081,170	72.03
1907	32,402	565,122	17.44	423,051	34,577,392	81.73
1908	92,356	1,507,310	16.32	349,210	29,339,134	84.02
1909	139,184	1,999,422	14.37	207,542	18,046,976	86.96
1910	195,938	2,999,824	15.37	139,430	12,200,154	87.50
1911	182,923	2,953,077	16.14	150,100	13,163,920	87.70
1912	318,372	4,805,574	15.09	105,506	8,870,075	84.07
1913	421,649	6,640,668	15.75	24,714	1,177,199	47.63
1914	868,368	18,696,718	21.53	18,376	647,288	35.22
1915	538,167	17,513,175	32.54	5,484	702,847	128.16
1916	439,185	15,187,593	34.58	21,666	2,383,765	110.02
1917	374,826	13,021,259	34.74	13,387	949,503	70.93
1918	293,719	17,852,176	60.78	18,213	1,247,800	68.51
1919	440,399	36,995,921	84.01	42,345	2,092,816	49.42
1920	575,3288	45,081,179	78.36	93,039	11,921,518	128.13

CATTLE—Continued.

TABLE 240.—*Cattle: Number and value on farms in the United States, 1867–1921.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of numbers are obtained by applying estimated percentages of increase or decrease to the published numbers of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available. It should also be observed that the census of 1910, giving numbers as of Apr. 15, is not strictly comparable with former censuses, which related to numbers June 1.

Jan. 1—	Milk cows.			Other cattle.		
	Number.	Price per head Jan. 1.	Farm value Jan. 1.	Number.	Price per head Jan. 1.	Farm value Jan. 1.
1867	8, 349, 000	$28. 74	$239, 947, 000	11, 731, 000	$15. 79	$185, 254, 000
1868	8, 692, 000	26. 56	230, 817, 000	11, 942, 000	15. 06	179, 888, 000
1869	9, 248, 000	29. 15	269, 610, 000	12, 185, 000	18. 73	228, 183, 000
1870	10, 096, 000	32. 70	330, 175, 000	15, 388, 000	18. 87	290, 401, 000
1870, census June 1	*8, 935, 332*			*13, 566, 005*		
1871	10, 023, 000	33. 89	339, 701, 000	16, 212, 000	20. 78	336, 860, 000
1872	10, 304, 000	29. 45	303, 438, 000	16, 390, 000	18. 12	296, 932, 000
1873	10, 576, 000	26. 72	282, 559, 000	16, 414, 000	18. 06	296, 448, 000
1874	10, 705, 000	25. 63	274, 326, 000	16, 218, 000	17. 55	284, 706, 000
1875	10, 907, 000	25. 74	280, 701, 000	16, 313, 000	16. 91	275, 872, 000
1876	11, 085, 000	25. 61	283, 879, 000	16, 785, 000	17. 00	285, 387, 000
1877	11, 261, 000	25. 47	286, 778, 000	17, 956, 000	15. 99	287, 156, 000
1878	11, 300, 000	25. 74	290, 898, 000	19, 223, 000	16. 72	321, 346, 000
1879	11, 826, 000	21. 71	256, 721, 000	21, 408, 000	15. 38	329, 254, 000
1880	12, 027, 000	23. 27	279, 899, 000	21, 231, 000	16. 10	341, 761, 000
1880, census June 1	*12, 443, 120*			*22, 488, 550*		
1881	12, 369, 000	23. 95	296, 277, 000	20, 939, 000	17. 33	362, 862, 000
1882	12, 612, 000	25. 89	326, 489, 000	23, 280, 000	19. 89	463, 070, 000
1883	13, 126, 000	30. 21	396, 575, 000	28, 046, 000	21. 81	611, 549, 000
1884	13, 501, 000	31. 37	423, 487, 000	29, 046, 000	23. 52	683, 229, 000
1885	13, 905, 000	29. 70	412, 903, 000	29, 867, 000	23. 25	694, 383, 000
1886	14, 235, 000	27. 40	389, 986, 000	31, 275, 000	21. 17	661, 956, 000
1887	14, 522, 000	26. 08	378, 790, 000	33, 512, 000	19. 79	663, 138, 000
1888	14, 856, 000	24. 65	366, 252, 000	34, 378, 000	17. 79	611, 751, 000
1889	15, 299, 000	23. 94	366, 226, 000	35, 032, 000	17. 05	597, 237, 000
1890	15, 953, 000	22. 14	353, 152, 000	36, 849, 000	15. 21	560, 625, 000
1890, census June 1	*16, 511, 950*			*33, 734, 128*		
1891	16, 020, 000	21. 62	346, 398, 000	36, 876, 000	14. 76	544, 128, 000
1892	16, 416, 000	21. 40	351, 378, 000	37, 051, 000	15. 16	570, 749, 000
1893	16, 424, 000	21. 75	357, 300, 000	35, 054, 000	15. 24	547, 882, 000
1894	16, 487, 000	21. 77	358, 999, 000	36, 608, 000	14. 66	536, 790, 000
1895	16, 505, 000	21. 97	362, 602, 000	34, 364, 000	14. 06	482, 999, 000
1896	16, 138, 000	22. 55	363, 956, 000	32, 085, 000	15. 86	508, 928, 000
1897	15, 942, 000	23. 16	369, 240, 000	30, 508, 000	16. 65	507, 929, 000
1898	15, 841, 000	27. 45	434, 814, 000	29, 264, 000	20. 92	612, 297, 000
1899	15, 990, 000	29. 66	474, 234, 000	27, 994, 000	22. 79	637, 931, 000
1900	16, 292, 000	31. 60	514, 812, 000	27, 610, 000	24. 97	689, 486, 000
1900, census June 1	*17, 135, 633*			*50, 585, 777*		
1901 [1]	16, 834, 000	30. 00	505, 093, 000	45, 500, 000	19. 93	906, 644, 000
1902	16, 697, 000	29. 23	488, 130, 000	44, 728, 000	18. 76	839, 126, 000
1903	17, 105, 000	30. 21	516, 712, 000	44, 659, 000	18. 45	824, 055, 000
1904	17, 420, 000	29. 21	508, 841, 000	43, 629, 000	16. 32	712, 178, 000
1905	17, 572, 000	27. 44	482, 272, 000	43, 669, 000	15. 15	661, 571, 000
1906	19, 794, 000	29. 44	582, 789, 000	47, 068, 000	15. 85	746, 172, 000
1907	20, 968, 000	31. 00	645, 497, 000	51, 566, 000	17. 10	881, 557, 000
1908	21, 194, 000	30. 67	650, 057, 000	50, 073, 000	16. 89	845, 938, 000
1909	21, 720, 000	32. 36	702, 945, 000	49, 379, 000	17. 49	863, 754, 000
1910	21, 801, 000			47, 279, 000		
1910, census Apr. 15	*20, 625, 432*	35. 29	727, 802, 000	*41, 178, 434*	19. 07	785, 261, 000
1911 [1]	20, 823, 000	39. 97	832, 209, 000	39, 679, 000	20. 54	815, 184, 000
1912	20, 699, 000	39. 39	815, 414, 000	37, 260, 000	21. 20	790, 064, 000
1913	20, 497, 000	45. 02	922, 783, 000	36, 030, 000	26. 36	949, 645, 000
1914	20, 737, 000	53. 94	1, 118, 487, 000	35, 855, 000	31. 13	1, 116, 333, 000
1915	21, 262, 000	55. 33	1, 176, 338, 000	37, 067, 000	33. 38	1, 237, 376, 000
1916	22, 108, 000	53. 92	1, 191, 955, 000	39, 812, 000	33. 53	1, 334, 928, 000
1917	22, 894, 000	59. 63	1, 365, 251, 000	41, 689, 000	35. 88	1, 497, 621, 000
1918	23, 310, 000	70. 54	1, 644, 231, 000	44, 112, 000	40. 88	1, 803, 482, 000
1919	23, 475 000	78. 20	1, 835, 770, 000	45, 085, 000	44. 22	1, 993, 442, 000
1920	23, 619, 000	85. 11	2, 010, 128, 000	44, 750, 000	43. 22	1, 934, 185, 000
1921	23, 321, 000	63. 97	1, 491, 900, 000	42, 870, 000	31. 41	1, 346, 665, 000

[1] Estimates of numbers revised, based on census data.

CATTLE—Continued.

TABLE 241.—*Cattle: Number and value on farms Jan. 1, 1920 and 1921, by States.*

State.	Milk cows.						Other cattle.					
	Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—		Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—	
	1921	1920	1921	1920	1921	1920	1921	1920	1921	1920	1921	1920
Me	171	176	$60.00	$79.00	$10,260	$13,904	129	140	$27.30	$35.90	$3,522	$5,026
N. H	101	103	74.00	86.00	7,474	8,858	70	70	31.90	41.70	2,233	2,919
Vt	275	275	65.00	89.00	17,875	24,475	186	190	24.50	37.20	4,557	7,068
Mass	157	159	94.00	105.00	14,758	16,695	100	100	37.30	44.80	3,730	4,480
R. I	18	19	100.00	110.00	1,800	2,090	12	13	36.00	46.90	432	610
Conn	117	118	90.00	105.00	10,530	12,390	80	80	41.80	47.70	3,344	3,816
N. Y	1,448	1,493	73.00	107.00	105,704	159,751	882	909	33.00	48.30	29,106	43,905
N. J	151	151	110.00	128.00	16,610	19,328	73	75	49.00	57.00	3,577	4,275
Pa	951	970	77.00	98.00	73,227	95,060	691	720	35.40	46.00	24,461	33,120
Del	45	45	81.00	85.00	3,645	3,825	22	23	40.60	46.80	893	1,076
Md	180	180	79.00	89.00	14,220	16,020	136	136	42.90	50.40	5,834	6,854
Va	428	428	59.00	76.00	25,252	32,528	567	573	36.70	49.20	20,809	28,192
W. Va	245	245	66.00	76.00	16,170	18,620	366	373	42.50	51.70	15,555	19,284
N. C	331	328	58.00	78.00	19,198	25,584	386	394	26.60	35.30	10,268	13,908
S. C	215	213	58.00	85.00	12,470	18,105	254	254	21.80	36.50	5,537	9,271
Ga	470	461	45.00	65.00	21,150	29,965	763	771	20.00	27.20	15,260	20,971
Fla	156	156	74.00	72.00	11,544	11,232	917	945	21.60	27.30	19,807	25,798
Ohio	1,009	1,030	71.50	92.00	72,144	94,760	996	1,060	37.50	48.70	37,350	51,622
Ind	727	734	65.00	88.00	47,255	64,592	710	772	38.10	51.60	27,051	39,835
Ill	1,028	1,060	63.00	96.00	64,764	101,760	1,244	1,367	36.20	54.60	45,033	74,638
Mich	856	873	70.00	96.00	59,920	83,808	727	773	30.00	42.80	21,810	33,084
Wis	1,828	1,846	65.00	97.00	118,820	179,062	1,478	1,493	26.90	40.20	39,758	60,019
Minn	1,395	1,395	58.00	82.00	80,910	114,390	1,661	1,730	20.60	32.60	34,217	56,398
Iowa	1,252	1,291	62.00	88.00	77,624	113,608	2,969	3,192	33.80	49.00	100,352	156,408
Mo	873	919	57.50	79.00	50,198	72,601	1,659	1,746	34.50	48.90	57,236	85,379
N. Dak	464	464	55.00	77.00	25,520	35,728	604	623	27.70	41.40	16,731	25,792
S. Dak	539	561	56.00	75.00	30,184	42,075	1,297	1,526	29.90	44.30	38,780	67,602
Nebr	560	577	63.00	83.00	35,280	47,891	2,650	2,850	33.40	45.30	88,510	129,105
Kans	898	935	62.00	81.00	55,676	75,735	2,075	2,161	33.20	48.00	68,890	103,728
Ky	466	457	57.00	73.00	26,562	33,361	562	592	30.10	41.20	16,916	24,390
Tenn	386	390	49.00	70.00	18,914	27,300	570	600	20.90	32.80	11,913	19,680
Ala	507	502	40.00	57.00	20,280	28,614	791	842	13.60	22.90	10,758	19,282
Miss	571	571	47.00	62.00	26,837	35,402	680	716	14.10	23.50	9,588	16,826
La	382	378	52.00	67.00	19,864	25,326	725	725	22.10	29.30	16,022	21,242
Tex	1,184	1,138	63.00	77.00	74,592	87,626	4,547	4,458	30.50	41.80	138,684	186,344
Okla	549	560	52.00	68.00	28,548	38,080	1,118	1,300	28.10	41.70	31,416	51,210
Ark	429	452	43.00	56.00	18,447	25,312	643	691	14.00	24.40	9,002	16,860
Mont	185	185	75.00	83.00	13,875	15,355	918	1,020	38.30	50.60	35,159	51,612
Wyo	80	80	75.00	93.00	6,000	7,440	720	800	40.80	50.50	29,376	40,400
Colo	272	272	70.00	87.00	19,040	23,664	1,220	1,355	34.80	48.10	42,456	65,176
N. Mex	91	87	73.00	83.00	6,643	7,221	1,406	1,378	35.10	45.50	49,351	62,699
Ariz	45	50	105.00	95.00	4,725	4,750	1,100	1,000	38.00	44.00	41,800	44,000
Utah	108	109	70.00	78.00	7,560	8,502	473	493	29.20	39.30	13,812	19,375
Nev	32	31	86.00	88.00	2,752	2,728	540	535	36.00	45.00	19,440	24,075
Idaho	137	136	72.00	85.00	9,864	11,560	505	537	33.70	44.10	17,018	23,682
Wash	216	225	75.00	88.00	16,200	19,800	290	305	34.30	43.80	9,947	13,359
Oreg	216	220	75.00	83.00	16,200	18,260	675	710	37.50	46.20	25,312	32,802
Calif	577	571	95.00	97.00	54,815	55,387	1,683	1,634	44.00	51.40	74,052	83,988
U. S	23,321	23,619	63.97	85.11	1,491,900	2,010,128	42,870	44,750	31.41	43.22	1,346,665	1,934,185

CATTLE—Continued.

TABLE 242.—*Cattle: Percentage of the different breeds in the United States, by States.*

Estimates below are based upon the following inquiry of live-stock reporters: "Letting 100 represent the total number in your locality, what proportion of the total belong to the breeds named? Grades and scrubs should be included in the breed in which the type predominates."

State and division.	Aberdeen Angus.	Ayrshire.	Brown Swiss.	Devon.	Dutch Belted.	Galloway.	Guernsey.	Hereford.	Holstein.	Jersey.	Polled Durham.	Red Polled.	Short Horn (Durham).	Other.	Nondescript.
Maine	0.1	4.1	0.2	0.4	1.6	0.3	8.8	7.3	30.9	34.9	0.1	0.1	4.6	1.0	5.6
New Hampshire	.1	4.3	.2	2.2	.4	.....	6.4	5.2	52.6	12.1	.....	.1	6.0	1.5	8.9
Vermont	.....	8.5	.7	.5	.2	.....	8.9	.9	45.0	22.9	.....	.1	4.9	3.4	4.0
Massachusetts	.....	8.9	.1	.5	.4	.....	11.5	1.2	56.3	10.3	.....	.....	3.2	2.0	5.6
Rhode Island	.....	20.4	.1	.1	.1	.....	7.0	.....	58.2	6.7	.....	.1	.1	.4	6.8
Connecticut	.2	7.9	.2	2.9	.3	.....	10.7	.6	55.2	13.0	.8	.....	1.6	2.5	4.1
New York	.2	5.8	.2	.1	.2	.1	7.4	.2	65.2	10.5	.1	.1	2.2	1.8	5.9
New Jersey	.....	3.0	.1	.3	.7	.7	8.4	2.4	60.0	9.0	.1	.....	2.6	1.8	10.9
Pennsylvania	.8	1.4	.6	.3	.5	.1	10.5	2.7	43.8	15.3	.2	.3	11.5	2.8	9.2
Delaware	1.9	.3	1.1	1.8	.2	.....	15.5	1.7	41.0	10.4	.1	.....	5.1	9.3	11.6
Maryland	1.8	.9	.2	.7	.5	.2	15.6	3.7	23.7	17.0	.3	.4	7.2	5.8	22.0
Virginia	4.2	.2	.2	.....	.....	.1	2.9	12.4	13.8	19.0	.7	3.8	25.4	2.9	14.4
West Virginia	10.4	.2	.4	.3	.1	1.0	1.7	33.0	6.0	16.0	.8	1.0	17.7	2.2	9.2
North Carolina	2.5	.1	.....	3.0	.....	.....	6.9	3.9	8.0	39.4	.2	.9	7.2	6.3	21.6
South Carolina	.8	.9	.1	1.8	.1	.....	5.5	4.6	8.3	44.7	.9	2.7	1.8	6.7	21.1
Georgia	.9	.2	.....	.4	.....	.....	.9	6.3	6.4	37.1	.1	1.7	4.1	8.7	33.2
Florida	1.1	.1	.....	.....	.....	.1	1.3	2.9	3.7	30.5	.....	.3	1.9	11.5	46.6
Ohio	3.0	.3	.2	.....	.1	.4	3.9	6.5	20.9	27.4	1.4	1.9	24.4	1.6	8.0
Indiana	6.0	.1	.3	.1	.1	.7	1.8	12.3	11.5	26.6	3.1	1.0	27.0	3.2	6.2
Illinois	7.6	.2	.8	.1	.1	1.2	1.8	16.0	16.4	11.9	3.0	1.9	31.3	1.4	6.3
Michigan	1.7	.5	.6	.1	.1	.7	6.1	4.1	40.0	11.1	1.4	1.7	23.9	1.8	6.2
Wisconsin	1.0	.7	1.2	.1	.1	.4	13.2	2.7	46.5	6.7	.7	1.8	15.2	2.7	7.0
Minnesota	4.7	.4	.4	.....	.1	1.3	5.9	8.5	19.3	3.7	1.3	4.2	33.2	3.2	13.8
Iowa	11.7	.2	.2	.2	.1	1.2	1.7	20.6	6.9	4.1	1.3	1.8	43.9	1.8	4.3
Missouri	9.9	.1	.2	.1	.....	1.9	1.1	22.7	5.2	13.4	1.3	3.1	32.2	2.1	6.7
North Dakota	5.0	.3	.4	.....	.....	1.0	.7	19.5	8.0	2.2	.9	4.0	44.3	2.9	10.8
South Dakota	4.7	.1	.3	.1	.1	1.1	.8	36.1	6.3	1.3	2.3	3.5	33.7	1.6	8.[illegible]
Nebraska	6.0	.2	.1	.....	.2	2.2	.5	33.1	4.9	2.3	3.3	3.9	35.8	2.1	5.4
Kansas	3.6	.5	.2	.2	.1	3.6	1.4	29.8	9.3	5.8	2.0	3.5	32.0	2.5	5.5
Kentucky	5.2	.1	.....	.1	.....	.....	.8	12.6	8.0	26.6	3.5	3.6	22.9	4.4	12.2
Tennessee	8.3	.....	.....	.3	.....	.....	.3	12.7	7.0	26.5	2.5	3.2	23.2	5.2	10.8
Alabama	4.2	.....	.....	.5	.....	.....	.4	7.3	7.3	41.1	.6	2.1	9.3	10.3	16.9
Mississippi	5.8	.....	.....	1.4	.....	.....	.5	10.8	4.8	36.2	1.8	6.1	9.0	6.6	17.0
Louisiana	3.0	.....	.....	1.1	.1	.7	.....	8.8	3.5	22.4	4.6	5.0	6.7	7.2	36.9
Texas	1.6	.....	.....	.....	1.7	.4	.2	38.6	3.4	19.4	2.2	7.1	13.2	2.9	9.3
Oklahoma	1.5	.....	.2	.....	.1	.6	.9	19.3	6.0	14.1	3.1	4.7	31.2	4.7	13.6
Arkansas	2.7	.....	.1	.1	.2	.2	.8	9.9	8.7	23.1	2.0	5.6	16.5	4.8	25.3
Montana	1.7	.2	.1	.....	.....	.2	.7	46.9	5.7	2.2	2.8	1.1	30.0	.8	7.6
Wyoming	.4	.3	.....	.....	.....	.2	.1	62.3	7.4	1.9	.7	.2	19.3	3.9	3.3
Colorado	.8	.....	.1	.1	.....	1.6	1.9	47.4	9.0	3.7	.7	1.0	29.6	1.9	2.2
New Mexico	.4	.....	.....	.1	.....	.1	.2	74.6	6.6	6.4	.3	.4	5.8	1.7	3.4
Arizona	.....	.....	.....	.....	.....	.....	.4	66.8	15.2	9.1	.....	.....	3.4	1.1	4.0
Utah	.4	.1	.....	.....	.....	.3	.8	40.1	10.9	7.6	.6	.9	33.7	.9	3.7
Nevada	.....	.1	.....	1.2	.....	.1	.1	12.0	1.1	.2	.....	.....	20.5	2.0	62.7
Idaho	.4	.5	.4	.....	.....	.4	1.8	28.9	14.0	10.6	.5	.7	34.3	2.0	5.5
Washington	.2	1.4	.4	.....	.....	.....	7.7	5.0	29.0	27.1	.3	.4	16.7	3.3	8.5
Oregon	4.3	.6	.1	.1	.....	.1	1.6	22.6	7.6	21.5	.....	.9	32.7	1.6	6.3
California	.1	.1	.3	1.4	.....	.1	1.7	15.0	37.0	12.4	1.8	.....	24.2	1.9	4.0
United States	3.6	.6	.3	.3	.2	.8	2.9	21.0	16.2	14.0	1.5	2.6	22.6	3.1	10.3
North Atlantic	.3	4.8	.4	.4	.4	.1	8.8	1.7	54.0	14.3	.1	.2	5.4	2.2	6.9
South Atlantic	2.9	.3	.1	.7	.....	.2	3.6	9.1	9.0	29.5	.4	1.6	9.5	6.8	26.3
N. C., east Miss. R.	3.6	.4	.7	.1	.1	.7	6.3	7.8	29.3	15.3	1.8	1.7	23.3	2.1	6.8
N. C., west Miss. R.	6.9	.3	.2	.1	.1	1.8	1.9	24.2	8.7	4.8	1.9	3.3	36.2	2.3	7.3
South Central	3.1	.....	.....	.3	.7	.3	.4	22.5	5.2	23.8	2.4	5.4	15.9	4.9	15.1
Far Western	.8	.2	.1	.4	.....	.3	1.3	40.9	14.9	8.8	.9	.5	21.9	1.8	7.2

CATTLE—Continued.

TABLE 243.—*Beef cattle: Farm price per 100 pounds, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$8.99	$9.65	$8.33	$6.86	$5.85	$5.99	$6.04	$5.40	$4.46	$4.58	$6.62
Feb. 15	8.98	10.02	8.55	7.36	5.99	5.93	6.16	5.55	4.61	4.57	6.77
Mar. 15	9.08	10.34	8.85	7.91	6.37	5.92	6.28	5.88	4.75	4.66	7.00
Apr. 15	9.20	10.81	9.73	8.57	6.66	5.96	6.29	6.08	5.15	4.67	7.31
May 15	8.97	10.84	10.38	8.70	6.73	6.13	6.33	6.01	5.36	4.59	7.40
June 15	9.32	10.20	10.40	8.65	6.91	6.20	6.32	6.02	5.23	4.43	7.37
July 15	8.93	9.96	10.07	8.30	6.78	6.07	6.38	5.98	5.17	4.28	7.19
Aug. 15	8.56	9.82	9.71	8.17	6.51	6.18	6.47	5.91	5.37	4.39	7.11
Sept. 15	8.29	9.02	9.63	8.40	6.55	6.06	6.38	5.92	5.35	4.43	7.00
Oct. 15	7.77	8.65	9.33	8.35	6.37	6.04	6.23	6.05	5.36	4.32	6.85
Nov. 15	7.15	8.65	9.14	8.21	6.44	5.85	6.02	5.99	5.22	4.36	6.70
Dec. 15	6.36	8.63	9.28	8.24	6.56	5.75	6.01	5.96	5.33	4.37	6.65

TABLE 244.—*Milk cows: Farm price per head, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$94.42	$86.10	$76.54	$63.92	$57.79	$58.47	$57.99	$49.51	$42.89	$44.70	$63.23
Feb. 15	95.27	86.15	78.36	65.93	57.99	57.99	59.09	51.42	43.40	44.48	64.01
Mar. 15	94.94	88.15	80.71	68.46	59.51	58.00	59.23	54.02	44.09	45.42	65.25
Apr. 15	95.36	90.91	82.45	72.09	60.68	57.78	59.60	55.34	45.14	44.81	66.42
May 15	94.56	93.43	84.11	72.78	60.98	58.29	59.85	54.80	45.63	44.54	66.90
June 15	94.56	93.84	84.74	72.87	61.63	58.59	59.82	55.20	45.84	43.86	67.10
July 15	91.23	94.51	84.97	72.81	62.04	60.31	59.67	54.80	45.41	42.44	66.82
Aug. 15	90.50	94.72	84.06	72.53	61.32	58.34	60.72	54.78	46.11	42.26	66.53
Sept. 15	89.40	93.42	85.21	73.93	61.41	58.38	59.58	55.78	46.79	42.22	66.61
Oct. 15	85.90	93.43	85.41	75.79	62.19	58.76	59.53	56.47	47.30	42.69	66.75
Nov. 15	77.56	93.27	84.51	75.00	62.67	57.35	58.77	57.71	47.38	42.70	65.69
Dec. 15	70.42	95.54	85.78	76.16	63.18	56.79	58.23	57.19	48.62	42.72	65.46

TABLE 245.—*Veal calves: Farm price per 100 pounds, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$12.89	$12.39	$11.16	$9.15	$7.67	$7.66	$7.89	$7.06	$6.06	$6.50	$8.84
Feb. 15	13.12	12.18	11.17	9.88	7.87	7.62	7.90	7.23	6.07	6.38	8.94
Mar. 15	12.98	12.65	11.33	9.94	8.11	7.50	7.92	7.49	6.11	6.48	9.05
Apr. 15	12.72	12.78	11.71	10.49	8.00	7.31	7.68	7.38	6.22	5.96	9.02
May 15	11.69	12.11	11.62	10.48	8.08	7.35	7.59	7.17	6.23	5.68	8.80
June 15	11.68	12.40	11.88	10.60	8.39	7.53	7.69	7.53	6.33	5.72	8.93
July 15	11.44	13.38	12.33	10.77	8.54	7.87	7.80	7.46	6.33	5.74	9.17
Aug. 15	11.64	13.43	12.22	10.56	8.59	7.75	8.08	7.53	6.62	5.93	9.24
Sept. 15	11.88	13.39	12.57	11.08	8.77	7.80	8.06	7.73	6.83	6.11	9.42
Oct. 15	11.64	12.87	12.35	11.10	8.59	7.91	7.97	7.72	6.90	6.15	9.32
Nov. 15	10.77	12.65	11.94	10.66	8.60	7.69	7.78	7.70	6.77	6.10	9.07
Dec. 15	9.27	12.67	12.31	10.98	8.79	7.61	7.61	7.74	6.88	5.98	8.98

CATTLE—Continued.

TABLE 246.—*Cattle: Wholesale price per 100 pounds, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago, inferior to prime.			Cincinnati, medium to heavy butcher steers.			St. Louis, good to choice native steers.			Kansas City, common to prime.			Omaha, native beeves.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.															
January-June	$5.65	$9.85	$7.81	$4.65	$7.65	$5.92	$8.00	$9.25	$9.05	$4.75	$9.00	.....	$7.00	$9.50	$8.22
July-December	5.00	10.25	8.14	4.50	7.00	6.02	8.50	10.00	9.07	4.50	10.00	.....	7.70	9.25	8.64
1914.															
January-June	6.60	9.75	8.24	5.35	7.25	6.16	8.65	9.50	9.02	5.20	9.40	.....	6.50	10.50	8.23
July-December	5.40	11.75	8.99	4.65	7.25	5.27	9.30	11.10	10.24	4.50	11.35	.....	6.00	10.75	9.04
1915.															
January-June	5.30	10.15	7.96	4.85	7.00	5.90	7.00	10.00	8.06	6.00	9.75	$7.51	6.50	9.35	8.05
July-December	5.75	11.50	8.44	4.00	7.00	5.32	8.60	10.50	9.56	5.50	10.35	8.21	8.90	10.10	9.05
1916.															
January-June	6.90	11.50	9.04	5.25	9.50	6.96	6.50	10.50	8.20	6.90	11.50	8.84	7.20	11.00	8.97
July-December	6.50	13.25	9.43	5.50	9.00	6.79	8.00	11.50	9.59	6.00	12.00	9.51	8.25	11.50	9.88
1917.															
January-June	5.75	13.90	10.16	6.00	12.85	9.14	10.00	12.25	10.86	6.50	13.75	9.95	10.00	13.85	11.85
July-December	6.15	17.90	11.42	5.00	14.50	9.62	10.00	16.50	13.10	9.25	17.00	13.21	11.50	17.00	14.27
1918.															
January-June	8.25	18.60	13.59	6.50	17.00	11.17	10.50	16.00	13.05	7.75	18.25	12.08	10.00	18.25	14.36
July-December	15.00	20.50	17.90	6.00	17.00	11.62	9.00	20.50	14.27	13.00	19.60	15.92	14.75	19.00	17.00
1919.															
January-June	10.00	20.40	16.02	6.50	17.25	11.66	13.50	17.75	14.53	10.25	19.50	14.82	9.00	18.75	15.00
July-December	11.25	21.50	15.97	5.50	17.25	10.75	13.50	19.25	15.16	8.00	19.00	13.48	8.00	18.85	12.56
1920.															
January	9.00	19.50	13.57	6.50	15.00	10.31	11.50	19.00	14.64	8.75	18.00	13.14	9.00	16.50	12.29
February	9.00	17.00	12.86	6.00	13.50	9.50	10.50	16.00	13.45	8.00	17.00	12.09	8.00	14.50	10.62
March	8.50	15.75	12.22	7.00	14.00	10.50	8.50	15.50	12 08	8.00	15.00	11.61	8.00	14.25	11.38
April	8.50	16.00	12.12	7.00	14.00	10.25	10.00	14.75	12.33	9.00	15.00	12.03	8.00	14.00	11.33
May	10.00	14.40	12.02	11.50	13.25	12.35	10.00	14.25	12.02	10.00	14.25	11.84	8.00	13.50	10.44
June	9.75	17.25	14.08	11.25	17.00	13.56	11.75	16.50	14.89	10.00	17.25	13.32	8.50	16.50	13.11
January-June	8.50	19.50	12.81	6.00	17.00	11.08	8.50	19.00	13.24	8.00	18.00	12.34	8.00	16.50	11.53
July	9.00	17.25	13.27	11.00	16.00	13.20	10.10	17.00	15.39	9.00	17.00	13.05	7.00	16.50	12.44
August	8.65	17.75	13.18	10.00	14.50	12.31	14.00	16.60	15.52	8.00	16.85	12.69	7.00	17.00	11.80
September	9.25	18.00	14.82	10.00	14.00	12.22	15.00	16.50	15.94	7.00	17.65	12.71	8.00	17.50	13.36
October	10.50	17.75	14.06	10.00	14.00	11.75	15.00	17.75	16.26	7.00	17.70	12.10	9.00	17.50	12.94
November	7.00	18.10	12.50	8.00	13.50	11.00	12.00	16.00	13.38	7.00	17.70	11.17	6.50	14.00	9.93
December	6.10	15.50	10.09	4.50	11.50	7.90	4.50	13.00	8.32	6.00	14.50	9.98	6.00	13.75	8.92
July-December	6.10	18.10	12.99	4.50	16.00	11.40	4.50	17.75	14.14	6.00	17.70	11.95	6.00	17.50	11.56

BUTTER AND EGGS.

TABLE 247.—*Butter: Average price received by farmers on 1st of each month, by States, 1920, and United States, 1909–1919.*

State and year.	Butter, cents per pound.											
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Maine	68	68	68	65	64	60	55	64	61	65	67	64
New Hampshire	66	68	66	68	69	64	64	65	64	66	65	63
Vermont	74	67	67	69	68	66	65	62	65	65	64	65
Massachusetts	69	70	70	69	73	72	68	66	71	68	70	67
Rhode Island	70	68	64	72	70	72	69	69	70	71	70	55
Connecticut	70	69	71	66	68	68	69	70	65	66	67	65
New York	70	67	66	64	66	64	61	62	62	63	62	63
New Jersey	75	71	70	70	74	73	68	69	65	66	70	70
Pennsylvania	70	68	66	64	66	63	59	59	60	63	64	64
Delaware	67	65	65	62	62	66	63	60	65	62	65	64
Maryland	60	59	58	61	62	56	53	52	51	56	54	58
Virginia	55	53	54	53	53	50	46	47	47	51	49	49
West Virginia	59	57	55	55	54	53	45	46	47	50	56	53
North Carolina	51	52	52	50	49	46	47	46	47	49	47	50
South Carolina	58	52	56	56	53	57	55	54	52	54	54	53
Georgia	54	49	48	48	48	49	49	48	49	51	50	49
Florida	61	68	62	61	62	62	66	62	64	66	64	63
Ohio	62	59	56	58	58	54	52	50	52	53	53	56
Indiana	60	55	52	53	55	50	49	49	50	51	51	51
Illinois	59	58	53	56	55	53	52	53	54	55	53	53
Michigan	65	61	59	57	59	53	52	52	54	55	54	56
Wisconsin	67	63	60	63	63	58	57	56	56	57	57	58
Minnesota	67	61	59	58	62	57	54	56	54	56	56	57
Iowa	64	59	58	57	57	54	52	53	52	54	54	55
Missouri	54	48	48	50	49	46	46	46	47	48	48	48
North Dakota	65	61	53	55	56	54	49	50	49	52	52	53
South Dakota	65	60	57	57	59	54	51	53	53	53	56	54
Nebraska	63	56	50	54	52	53	50	51	50	52	56	53
Kansas	59	54	52	53	53	51	48	49	49	53	52	52
Kentucky	49	48	46	46	45	43	42	40	41	45	47	45
Tennessee	44	42	43	42	42	38	38	37	38	39	41	42
Alabama	45	44	44	44	45	43	43	42	43	45	43	43
Mississippi	51	48	45	48	48	46	43	47	45	43	45	47
Louisiana	57	50	49	53	48	48	47	50	47	53	50	52
Texas	54	48	48	46	45	43	41	44	43	44	46	48
Oklahoma	56	52	48	48	51	47	49	49	49	50	53	53
Arkansas	50	49	47	42	47	46	45	47	45	46	49	46
Montana	58	61	55	55	56	58	45	48	51	55	48	53
Wyoming	69	68	62	59	62	56	49	51	54	53	57	61
Colorado	68	58	55	59	59	54	51	55	54	57	57	58
New Mexico	70	68	58	62	64	64	54	61	54	67	60	61
Arizona	72	60	65	68	75	63	66	65	68	80	65	65
Utah	63	59	55	58	58	59	58	59	55	59	61	59
Nevada	......	60	60	64	63	62	62	60	60	66	60	65
Idaho	69	62	58	61	62	59	56	58	57	60	60	69
Washington	67	61	60	64	62	56	57	58	61	65	64	59
Oregon	67	65	63	64	63	58	57	57	58	64	57	58
California	65	65	61	64	61	60	59	58	61	65	64	64
United States	61.3	57.8	55.9	56.1	57.6	53.5	51.6	52.0	52.3	54.1	54.3	51.7
1919	54.9	49.6	43.8	47.6	50.3	49.1	47.2	48.2	49.7	51.5	56.0	60.0
1918	43.1	43.7	43.4	40.7	39.9	38.6	38.2	39.7	41.4	47.2	49.7	52.7
1917	34.0	33.5	34.1	33.5	36.1	35.0	33.5	34.0	36.1	38.9	40.9	41.9
1916	28.3	27.6	27.1	27.6	27.9	26.5	25.7	26.1	27.4	29.0	31.1	34.4
1915	28.7	27.9	26.8	25.8	25.7	24.8	24.2	24.2	24.5	25.3	26.4	27.6
1914	29.2	27.4	26.0	21.9	23.8	22.8	22.9	23.7	25.3	26.0	26.3	28.4
1913	28.4	27.6	27.5	27.6	27.0	25.5	24.7	24.9	25.9	27.5	28.2	29.2
1912	28.1	29.0	27.2	26.1	26.0	24.8	23.4	23.7	24.2	25.6	26.9	28.8
1911	27.8	24.1	22.7	22.6	21.4	20.3	20.4	21.7	23.1	23.8	25.2	27.4
1910	28.7	27.9	26.3	25.8	25.5	24.1	23.3	23.8	25.2	26.2	27.1	27.8
1909	......	25.1	24.5	24.2	24.0	22.5	21.9	22.4	23.3	25.0	26.2	27.4

BUTTER AND EGGS—Continued.

TABLE 248.—*Butter: Wholesale price per pound, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago, creamery, extra.			Cincinnati, creamery, extra.			Milwaukee, creamery, extra.			New York, creamery, extra.			Boston, creamery, extra.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June	25	36	......	31	40	......	27	35	......	26½	42	......	28	36½	......
July-December	24	36	......	30	39½	......	26	35½	......	26	37½	......	27	35	......
1914.															
January-June	24	35½	......	27½	39½	......	23½	35½	......	24½	50	......	25	34½	......
July-December	26	34	......	30	38	......	26	34	......	26¾	36½	......	27½	33½	......
1915.															
January-June	26	34	......	29½	38	......	25½	34	......	24	36	......	27	33½	......
July-December	24	34	......	28	38	......	24	34	......	25	36½	......	26	32	......
1916.															
January-June	27½	36½	......	32	40	......	28	36	......	29	38	......	29½	35½	......
July-December	27½	42	......	31½	46	......	27½	42	......	28½	42½	......	29	39	......
1917.															
January-June	36	46	......	39	50	......	36	46	......	37½	46¾	......	38	47	......
July-December	36½	49	......	39	53	......	38½	48	......	37½	51½	......	39½	46	......
1918.															
January-June	40	49½	44.4	44½	54	49.0	40	49	44.3	40½	54¼	47.1	42	49	44.3
July-December	42½	67½	54.0	46	71	57.2	42½	65½	53.6	44½	70	56.2	44½	67	55.4
1919.															
January-June	42¼	68	56.4	47	71	60.4	41	66	51.9	46	71	58.5	47	69	58.8
July-December	48	72	60.4	......	......	......	......	......	......	49½	74	63.1	50½	73½	......
1920.															
January	59½	65	62.5	64	67	66.1	57	62	60.9	61½	69½	64.7	62	68	64.3
February	55	65½	61.8	65	67	66.0	50	61	54.1	63½	67½	66.5	64	66	64.9
March	56	68½	64.3	67	72½	69.3	60	65	63.0	63	68½	66.4	64	69	66.7
April	60	67½	63.9	67	69½	67.8	61	65	63.3	66½	76	71.2	66	71	68.5
May	52½	62	56.8	58½	65½	61.8	52	61	56.5	59	66	61.5	57	65	61.1
June	52	56½	54.6	55	60	58.0	52	56	54.1	55	60	57.4	55	59	56.8
January-June	52	68½	60.6	55	72½	64.8	50	65	58.6	55	76	64.6	55	71	63.7
July	53	56½	54.5	58	60	59.1	50	55	53.5	55	59	56.8	56	59	58.1
August	52	56	53.8	57	60	58.5	49	54	50.5	53¾	57	55.4	55	58	57.1
September	54½	59	56.5	58½	64	60.4	50	56½	52.6	56	62	59.2	57	62½	59.7
October	54	60	57.0	57	63½	60.2	48	58	53.2	56½	62½	60.0	56	62	59.7
November	53	62	59.7	62	63	62.5	49	52	50.8	57	65	63.5	57	61	59.8
December	47	58	51.1	57	58	54.4	44	50	45.6	52	58	55.3	52	54	53.4
July-December	47	62	55.4	57	64	59.2	44	58	51.0	52	65	58.4	52	62½	58.0

BUTTER AND EGGS—Continued.

TABLE 249.—*Butter: International trade, calendar years 1909–1919.*[1]

[Butter includes all butter made from milk, melted and renovated butter, but does not include margarine, coco butter, or ghee. See "General note," Table 230.]

EXPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Argentina	6,934	7,676	10,192	12,502	21,672	41,821	....
Australia	77,859	54,022	16,722	75,840	72,278	41,115	....
Austria-Hungary	4,267	....	....	....	....	....	....
Belgium	3,125						11
Canada	3,973	2,500	3,593	7,787	4,345	10,919	16,509
Denmark	195,530	210,084	223,964	211,090	135,502	32,306	....
Finland	26,337	24,567	20,015	8,960	....	....	....
France	40,769	39,616	44,566	18,937	6,728	2,620	1,119
Germany	498	....	....	....	....	....	....
Italy	7,870	9,310	7,488	792	172	109	51
Netherlands	75,133	84,407	93,352	78,910	54,215	5,415	30,242
New Zealand	38,761	48,616	47,056	40,167	28,492	48,275	....
Norway	3,137	1,575	3,607	1,027	(2)	(2)	....
Russia	150,294	118,997	119,359	22	....	....	....
Sweden	45,870	41,941	41,532	28,704	3	3	76
United States	4,125	3,688	17,943	26,561	7,193	26,194	34,556
Other countries	4,811	3,142	2,198	3,860	6,313	3,899	....
Total	689,293	650,141	651,587	515,159	336,913	212,676	....

IMPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	6,281	....	....	....	....	....	....
Belgium	14,024	....	....	....	....	....	11,177
Brazil	4,551	2,364	732	140	14	4	42
British South Africa	4,025	3,990	1,876	290	50	2,446	385
Canada	3,388	7,250	5,661	2,092	466	864	1,464
Denmark	6,241	3,054	687	191	1	(2)	....
Dutch East Indies	4,152	4,873	4,257	4,840	4,308	4,322	....
Egypt	2,350	1,945	1,194	705	533	302	602
Finland	2,370	2,959	4,916	3	....	....	....
France	13,713	13,655	1,711	625	742	984	12,752
Germany	111,441	....	....	....	....	....	....
Netherlands	4,987	3,880	905	991	52	43	615
Russia	2,202	2,969	2,615	5,922	....	....	....
Sweden	330	189	30	61	15,756	11,426	13,846
Switzerland	11,106	8,900	5,700	946	369	54	13,250
United Kingdom	455,489	436,019	426,355	240,270	201,605	176,692	174,340
Other countries	27,364	29,416	21,026	14,300	13,214	9,778	....
Total	674,014	521,463	477,665	271,376	237,110	206,915	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 pounds.

BUTTER AND EGGS—Continued.

TABLE 250.—*Butter: Receipts at seven leading markets in the United States, 1891–1920.*

[From Board of Trade, Chamber of Commerce, and Merchants' Exchange reports; for 1917 and subsequently from Bureau of Markets.]

Year.	Boston.	Chicago.	Milwaukee.	St. Louis.	San Francisco.	Total 5 cities.	Cincinnati.	New York.
	1,000 pounds.	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 packages.*	*1,000 packages.*
Averages:								
1891–1895	40, 955	145, 225	3, 996	13, 944	15, 240	219, 360	88	1, 741
1896–1900	50, 790	232, 289	5, 096	14, 582	14, 476	317, 233	157	2, 010
1901–1905	57, 716	245, 203	7, 164	14, 685	15, 026	339, 794	177	2, 122
1906–1910	66, 612	286, 518	8, 001	17, 903	13, 581	392, 615	169	2, 207
1901	57, 500	253, 809	5, 590	13, 477	14, 972	345, 348	233	2, 040
1902	54, 574	219, 233	7, 290	14, 573	14, 801	310. 471	223	1, 933
1903	54, 347	232, 032	6, 857	14, 080	13, 570	320, 886	121	2, 113
1904	55, 435	249, 024	7, 993	15, 727	14, 336	342, 515	147	2, 170
1905	66, 725	271, 915	8, 091	15, 566	17, 450	379, 747	155	2, 355
1906	65, 152	248, 648	8, 209	13, 198	9, 282	344, 489	205	2, 242
1907	63, 589	263, 715	8, 219	13, 453	17, 359	366, 335	187	2, 113
1908	69, 843	316, 695	8, 798	18, 614	13, 833	427, 783	166	2, 175
1909	65, 054	284, 547	7, 458	21, 086	14, 486	392, 631	150	2, 250
1910	69, 421	318, 986	7, 319	23, 163	13, 994	432, 883	135	2, 257
1911	63, 874	334, 932	8, 632	24, 839	21, 118	453, 395	162	2, 405
1912	71, 609	287, 799	6, 927	20, 399	24, 887	411, 621	120	2, 433
1913	71, 703	286, 220	9, 415	24, 686	23, 027	415, 051	102	2, 522
1914	73, 028	311, 557	9, 716	24, 614	22, 421	441, 336	72	2, 505
1915	82, 082	344, 879	8, 679	21, 264	28, 349	485, 253	129	2, 741
1916	79, 305	359, 195	7, 976	16, 445	28, 029	490, 950	151	2, 918
1917	69, 168	323, 100	6, 116	16, 996	25, 032	440, 412	63	2, 575
1918	71, 440	277, 661	5, 094	14, 164	22, 908	391, 267	68	2, 804
							Philadelphia.	
1919	73, 223	185, 779	6, 114	18, 111	22, 031	305, 528	683	2, 980
1920	72, 992	176, 745	4, 859	16, 273	23, 567	294, 436	648	2, 195
1920.								
January	3, 216	10, 065	303	909	1, 488	15, 981	43	157
February	3, 176	9, 447	246	940	1, 665	15, 473	47	149
March	5, 368	11, 398	338	1, 035	2, 178	20, 317	45	173
April	3, 709	10, 343	266	537	3, 141	17, 996	40	105
May	6, 322	17, 118	265	809	2, 767	27, 281	53	179
June	12, 060	25, 344	607	2, 191	2, 197	42, 399	83	269
July	14, 406	27, 633	748	2, 275	1, 744	46, 805	78	287
August	8, 749	20, 200	661	2, 068	1, 789	33, 468	64	243
September	6, 762	15, 455	470	1, 838	1, 722	26, 247	63	199
October	4, 372	11, 417	382	1, 304	1, 739	19, 214	50	161
November	2, 378	9, 528	312	1, 151	1, 565	14, 934	40	139
December	2, 474	8, 797	261	1, 216	1, 572	14, 321	42	134

BUTTER AND EGGS—Continued.

TABLE 251.—*Eggs: Average price received by farmers on 1st of each month, by States, 1920, and United States, 1909–1920.*

State and year.	Eggs, cents per dozen.											
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Maine	78	65	62	52	50	48	51	59	62	71	75	86
New Hampshire	77	78	64	55	55	57	60	64	71	74	81	86
Vermont	77	64	62	57	46	48	51	53	58	63	70	83
Massachusetts	90	89	72	63	64	63	65	68	75	78	93	101
Rhode Island	100	85	82	67	52	60	67	62	70	78	90	100
Connecticut	91	84	70	54	51	55	62	68	70	82	83	95
New York	79	72	62	49	46	47	48	54	59	65	72	81
New Jersey	84	70	68	53	49	51	56	63	64	67	86	95
Pennsylvania	75	70	61	45	40	42	45	49	52	59	69	75
Delaware	64	60	60	43	40	45	47	44	48	54	78	80
Maryland	66	60	54	40	39	39	40	44	49	55	57	75
Virginia	65	57	49	39	37	38	40	40	44	53	56	65
West Virginia	68	64	49	43	39	38	42	44	43	51	61	65
North Carolina	59	54	47	35	36	37	41	39	44	51	52	58
South Carolina	60	55	52	44	42	41	44	43	44	52	53	57
Georgia	61	51	44	38	36	37	38	39	42	49	52	55
Florida	66	51	51	41	36	38	41	45	47	55	64	69
Ohio	67	61	49	39	38	38	38	42	47	53	64	71
Indiana	64	58	45	38	37	36	35	40	45	51	58	67
Illinois	62	58	44	38	37	36	35	38	42	48	55	65
Michigan	69	62	51	40	38	39	38	42	46	49	57	65
Wisconsin	64	58	47	39	37	36	35	39	44	48	53	61
Minnesota	61	53	45	36	37	35	33	37	41	45	53	60
Iowa	63	53	42	37	37	36	34	38	41	46	53	61
Missouri	59	50	43	37	36	34	32	35	41	46	51	61
North Dakota	64	60	48	40	34	34	31	34	36	40	44	52
South Dakota	64	56	40	35	35	34	32	35	40	45	46	59
Nebraska	60	51	41	35	36	33	32	33	37	42	48	56
Kansas	59	48	40	35	35	33	30	33	37	45	49	60
Kentucky	60	54	44	36	34	35	34	36	39	47	51	61
Tennessee	56	50	42	34	33	32	31	32	37	46	49	58
Alabama	56	49	41	34	33	33	32	35	40	45	47	51
Mississippi	57	48	41	36	34	32	31	34	40	44	48	52
Louisiana	60	51	42	40	35	34	35	38	40	45	48	53
Texas	58	44	32	31	29	27	27	30	33	39	48	56
Oklahoma	63	51	37	34	32	28	29	30	36	40	50	56
Arkansas	56	47	39	33	32	33	31	34	37	43	47	52
Montana	72	59	57	47	38	38	41	38	45	50	50	58
Wyoming	74	67	51	44	42	39	42	47	49	51	59	70
Colorado	73	58	45	40	38	38	38	42	49	56	59	67
New Mexico	70	61	44	39	41	41	38	43	42	49	57	57
Arizona	83	72	47	45	50	46	45	54	60	80	78	78
Utah	71	58	38	35	37	36	38	39	43	45	52	64
Nevada	......	52	50	51	47	46	51	50	59	58	65	75
Idaho	78	63	46	37	38	39	41	43	48	55	60	70
Washington	71	56	43	36	38	40	39	42	49	57	66	70
Oregon	71	60	41	34	39	39	40	43	50	57	64	70
California	70	55	41	37	36	38	38	45	50	58	70	74
United States	64.8	56.9	46.6	38.8	37.4	37.0	36.7	40.0	44.2	50.1	56.9	65.0
1919	57.2	48.3	33.1	34.3	36.8	38.6	36.8	39.3	41.0	44.7	54.0	61.9
1918	46.3	49.4	40.4	31.2	31.0	29.8	30.7	34.4	36.4	41.6	47.2	55.0
1917	37.7	35.8	33.8	25.9	30.0	31.1	28.3	29.8	33.2	37.4	39.4	43.3
1916	30.6	26.8	21.2	17.9	18.1	19.0	19.7	20.7	23.3	28.1	32.2	38.1
1915	31.6	29.2	21.3	16.6	17.1	16.6	16.8	17.0	18.7	22.3	26.3	30.6
1914	30.7	28.4	24.2	17.6	16.8	17.3	17.6	18.2	21.0	23.5	25.3	29.7
1913	26.8	22.8	19.4	16.4	16.1	16.9	17.0	17.2	19.5	23.4	27.4	33.0
1912	29.5	29.1	24.5	17.8	17.1	16.7	16.7	17.4	19.1	22.0	25.9	29.7
1911	30.4	22.1	16.5	14.9	14.7	14.5	14.2	15.5	17.4	20.0	23.5	28.7
1910	30.5	28.9	22.9	18.6	18.6	18.3	18.2	17.6	19.4	22.4	25.3	29.0
1909	......	25.8	20.1	16.8	17.8	18.4	18.5	19.2	20.2	22.1	24.8	28.4

BUTTER AND EGGS—Continued.

TABLE 252.—*Eggs: Wholesale price per dozen, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago, fresh firsts.			Cincinnati.[1]			St. Louis, fresh firsts.			Milwaukee, fresh firsts.			New York, fresh firsts.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June....	16½	27½	......	15½	27½	......	14¼	25	......	14	25	......	20	40	......
July-December...	16	37	......	18½	42	......	12	35	......	13	35	......	25	65	......
1914.															
January-June....	17	32½	......	16½	36	......	14	31	......	15	30	......	20	50	......
July-December...	18	36	......	18½	38½	......	18	35	......	16	32	......	24	62	......
1915.															
January-June....	16	38	......	12½	40½	......	15¼	37½	......	15½	34	......	18	44	......
July-December...	16	30½	......	10	36	......	14½	30	......	15½	32	......	18	40	......
1916.															
January-June....	18½	32¼	......	17	34½	......	17	31	......	17	31	......	20½	35	......
July-December...	21¾	41	......	17½	47	......	22	39	......	19	38	......	23¾	47	......
1917.															
January-June....	26	49	......	22	53	......	25½	44	......	25½	44	......	28¼	53	......
July-December...	30¼	57	......	20	57	......	26	51	......	30¼	55	......	34	62	......
1918.															
January-June....	29	63	40.1	26	66	38.6	26	59	38.0	30	58	47.4	31½	70	44.5
July-December...	34	65	48.3	33	65	46.4	30	63	45.6	34	63	46.8	36	72	52.7
1919.															
January-June....	35	63½	42.8	32½	52	41.7	33	62	40.7	35	60	42.0	36½	68	46.9
July-December...	39	80	53.6	42	78	55.7	36½	72	50.2	39	74	50.9	51	94	64.4
1920.															
January..........	54½	71	64.3	65	77	71.2	56	66	60.7	54	62	59.3	60	85	73.6
February.........	50	57½	52.2	50	59	55.1	48½	56	50.0	47	58	51.1	56	64	61.2
March............	41	49½	44.1	40	53	44.5	40	47½	42.2	40	48	42.2	42½	60	49.1
April............	40	45¾	41.7	38	40	38.3	37½	39½	38.2	38	41	39.5	40½	46½	43.8
May..............	39	42½	41.2	40	41	40.8	36½	40	38.2	40	42	40.7	41	46½	44.4
June.............	37	42	38.9	37	43	39.3	33	37½	35.1	35	40	38.7	41	46	43.1
January-June..	37	71	47.1	37	77	48.2	33	66	44.1	35	62	45.2	40½	85	52.5
July.............	39	44½	42.2	41	45	43.5	37	41	38.7	38	43	40.8	42	50	46.7
August...........	44½	50½	46.7	43	45	45.8	42	47½	44.9	42	50	45.8	47	57	50.8
September........	50	55½	52.6	49	58	54.0	47½	51	50.0	49	55	52.4	53	61	56.5
October..........	56	59	57.8	58	62	60.5	51	58	54.6	54	58	56.4	57	71	65.6
November.........	60	73	68.1	63	77	69.5	58	71	65.2	55	68	63.4	68	81	76.5
December.........	59½	78	70.2	62	80	73.2	57	73	66.0	68	77	71.9	71	89	79.2
July-December	39	78	56.3	41	80	57.8	37	73	53.2	38	77	55.1	42	89	62.6

[1] 1918, fresh firsts; previous years include seconds.

BUTTER AND EGGS—Continued.

TABLE 253.—*Eggs: Receipts at seven leading markets in the United States, 1891–1920.*

[From Board of Trade, Chamber of Commerce, and Merchants' Exchange reports; for 1917 and subsequently from Bureau of Markets.]

Year.	Boston.	Chicago.	Cincinnati.	Milwaukee.	New York.	St. Louis.	San Francisco.	Total.
Averages:	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
1891–1895	722,363	1,879,065	288,548	90,943	2,113,946	557,320	166,059	5,818,244
1896–1900	912,807	2,196,631	362,262	113,327	2,664,074	852,457	194,087	7,295,645
1901–1905	1,155,340	2,990,675	418,842	139,718	3,057,298	1,000,935	304,933	9,067,741
1906–1910	1,517,995	4,467,040	509,017	180,362	4,046,360	1,304,719	334,766	12,360,259
1901	1,040,555	2,783,709	493,218	128,179	2,909,194	1,022,646	277,500	8,655,001
1902	1,053,165	2,659,340	464,799	114,732	2,743,642	825,999	285,058	8,146,735
1903	1,164,777	3,279,248	338,327	129,278	2,940,091	959,648	335,228	9,146,597
1904	1,122,819	3,113,858	377,263	166,409	3,215,924	1,216,124	319,637	9,532,034
1905	1,395,385	3,117,221	420,604	159,990	3,477,638	980,257	307,243	9,858,338
1906	1,709,531	3,583,878	484,208	187,561	3,981,013	1,023,125	137,074	11,106,390
1907	1,594,576	4,780,356	588,636	176,826	4,262,153	1,288,977	379,439	13,070,963
1908	1,436,786	4,569,014	441,072	207,558	3,703,990	1,439,868	347,436	12,145,724
1909	1,417,397	4,557,906	519,652	160,418	3,903,867	1,395,987	340,185	12,295,412
1910	1,431,686	4,844,045	511,519	179,448	4,380,777	1,375,638	469,698	13,192,811
1911	1,441,768	4,707,335	605,131	175,270	5,021,757	1,736,915	587,687	14,275,863
1912	1,580,106	4,556,643	668,942	136,896	4,723,520	1,394,534	638,890	13,699,531
1913	1,589,400	4,593,800	594,954	191,059	4,713,555	1,398,065	573,042	13,653,875
1914	1,531,329	4,083,163	461,927	224,797	4,882,222	1,474,212	619,500	13,277,150
1915	1,757,594	4,896,246	812,371	192,743	5,585,329	1,492,729	629,577	15,366,589
1916	1,649,828	5,452,737	853,910	208,924	4,858,274	1,521,506	575,014	15,120,193
1917	1,501,956	5,678,679	184,022	134,625	4,357,061	1,373,120	715,768	13,945,231
1918	1,604,289	5,049,743	176,733	180,616	5,026,548	934,668	666,845	13,639,442
			Philadelphia.					
1919	1,658,990	4,616,652	1,704,377	262,583	6,007,641	1,873,584	697,921	16,821,748
1920	1,647,648	4,153,584	1,395,909	219,465	5,157,535	1,906,153	757,058	15,237,352
1920.								
January	72,076	108,599	76,346	9,152	209,757	40,506	43,943	560,379
February	113,113	251,320	81,111	14,782	315,410	100,038	55,233	931,007
March	148,784	457,673	120,156	21,963	618,396	271,618	102,240	1,740,830
April	252,858	839,602	164,010	29,218	562,530	243,215	113,461	2,204,894
May	381,322	800,186	242,466	45,953	882,953	282,453	80,436	2,718,451
June	204,280	620,198	180,152	30,904	672,873	200,014	75,642	1,984,063
July	118,811	379,828	106,634	18,672	469,638	145,719	67,349	1,306,651
August	110,081	259,850	115,775	13,644	384,878	145,390	51,952	1,081,570
September	95,170	217,100	117,955	8,808	350,484	144,990	42,220	976,727
October	65,442	131,812	80,924	10,812	271,724	137,630	43,115	741,759
November	48,988	47,233	56,629	7,685	208,674	124,803	35,496	529,508
December	33,723	40,183	53,751	7,872	210,536	69,777	42,671	458,513

CHEESE.

TABLE 254.—*Cheese: International trade, calendar years 1909–1919.*[1]

[Cheese includes all cheese made from milk; "cottage cheese," of course, is included. See "General note," Table 220.]

EXPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Bulgaria	5,584	....	....	....	....	....	....
Canada	167,260	138,265	160,660	170,248	176,380	164,163	107,633
France	26,880	22,324	16,242	11,704	7,403	5,213	7,336
Germany	1,967	....	....	....	....	....	....
Italy	60,560	66,004	65,762	39,323	4,337	938	1,821
Netherlands	127,379	149,574	190,334	199,599	123,634	32,893	27,372
New Zealand	55,561	96,743	91,533	106,335	99,203	98,944	....
Russia	7,011	3,827	995	105	....	....	....
Switzerland	70,075	77,573	74,775	47,215	12,861	2,680	1,369
United States	5,142	3,797	62,953	54,093	53,372	48,405	14,160
Other countries	10,705	12,175	18,937	26,294	28,664	24,440	....
Total	538,124	570,282	682,191	654,828	505,854	377,676	....

IMPORTS.

Country.	Average 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Algeria	6,592	6,738	4,658	4,275	2,802	2,475	2,692
Argentina	10,447	8,453	7,306	3,133	689	82	....
Australia	360	230	1,532	86	46	14	....
Austria-Hungary	12,298	....	....	....	....	....	....
Belgium	31,771	....	....	....	....	....	16,555
Brazil	4,178	3,288	2,300	1,423	337	159	210
British South Africa	5,169	5,044	3,955	2,109	530	252	36
Cuba	4,520	4,229	2,839	2,715	1,835	3,318	....
Denmark	1,414	1,048	847	318	39	(2)	....
Egypt	8,182	5,953	5,785	1,865	148	2,794	179
France	49,055	45,521	46,744	24,139	12,047	11,206	15,232
Germany	48,687	....	....	....	....	....	....
Italy	13,308	9,838	3,472	252	9	746	11,151
Russia	3,911	4,199	3,738	2,066	....	....	....
Spain	5,032	5,150	3,202	1,465	410	238	557
Switzerland	7,150	4,717	3,410	427	214	87	996
United Kingdom	257,407	266,591	299,920	287,115	327,981	263,132	237,086
United States	46,346	55,477	38,919	28,516	6,333	7,562	11,332
Other countries	19,589	12,380	9,598	6,812	5,791	3,457	....
Total	535,417	438,847	438,225	366,716	359,211	295,522	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

[2] Less than 500 pounds.

CHICKENS AND TURKEYS.

TABLE 255.—*Chickens: Average price received by farmers on 1st of each month, by States, 1920, and United States, 1909–1920.*

State.	Chickens, cents per pound.											
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Maine	31.9	31.0	32.0	29.9	35.7	35.7	32.0	35.8	32.9	35.6	35.0	33.0
New Hampshire	30.0	28.3	35.0	34.2	35.8	33.3	33.5	37.0	32.7	40.0	32.0	33.0
Vermont	30.0	31.7	33.4	34.6	35.6	39.6	36.5	35.1	35.4	34.7	34.0	31.5
Massachusetts	38.1	37.5	38.0	38.9	40.0	42.0	41.5	38.8	47.0	44.0	41.0	36.0
Rhode Island	36.0	38.5	40.0	43.0	41.5	41.0	45.0	43.3	40.0	45.3	30.0	39.5
Connecticut	35.4	37.0	36.2	36.1	40.0	41.0	41.0	39.3	38.0	36.5	37.0	35.0
New York	30.2	31.4	32.9	33.9	35.9	34.7	34.4	36.4	34.7	33.3	31.5	30.0
New Jersey	33.8	30.8	35.0	38.3	39.9	38.2	39.2	35.6	36.1	36.0	37.0	36.0
Pennsylvania	27.0	28.9	30.2	30.8	32.5	33.3	33.4	32.5	31.5	33.8	30.5	28.5
Delaware	25.0	29.0	30.0	41.0	40.0	36.7	40.0	25.0	28.0	31.7	42.5	29.5
Maryland	29.2	30.8	32.5	35.3	36.3	34.3	34.3	40.1	33.8	33.4	30.9	28.7
Virginia	28.7	29.5	31.2	31.8	32.8	35.8	36.3	36.4	32.8	33.5	30.0	28.5
West Virginia	25.5	23.4	23.0	26.1	27.1	26.7	27.7	29.6	29.4	27.0	26.6	24.5
North Carolina	23.7	24.4	26.5	26.8	27.4	28.0	31.8	30.7	30.4	29.0	26.2	26.0
South Carolina	29.4	30.5	29.1	28.5	29.3	32.2	28.0	36.0	31.9	30.6	31.7	29.0
Georgia	26.8	21.8	24.6	26.1	27.2	30.0	32.0	30.7	32.0	29.0	26.6	26.0
Florida	30.8	31.8	31.7	30.7	28.8	31.5	31.7	32.0	32.5	32.0	28.3	32.6
Ohio	23.5	24.6	26.5	28.7	29.1	29.1	28.1	27.2	28.1	27.4	23.0	22.5
Indiana	21.6	24.5	25.3	27.8	27.6	27.1	27.2	28.6	27.0	27.0	20.9	30.3
Illinois	21.0	23.9	25.5	27.0	27.6	26.5	26.8	26.1	26.2	26.2	21.3	20.0
Michigan	21.6	23.6	25.0	26.5	28.1	27.4	25.6	26.8	26.7	25.0	21.9	20.0
Wisconsin	19.5	21.9	23.3	24.7	25.6	25.3	24.1	25.5	24.0	23.7	18.7	19.3
Minnesota	17.4	18.9	20.4	21.7	21.1	21.2	20.7	19.9	20.5	21.1	18.3	16.2
Iowa	19.3	20.5	21.8	23.4	23.0	22.8	23.0	23.7	23.6	23.4	19.3	18.0
Missouri	19.5	23.1	25.3	28.1	27.4	26.0	27.5	27.9	25.7	24.4	20.2	19.0
North Dakota	17.5	16.5	18.9	18.5	20.4	17.2	18.5	18.4	18.8	19.9	16.4	15.5
South Dakota	18.5	17.8	18.8	19.1	21.6	20.1	20.6	20.2	21.7	23.2	17.8	17.0
Nebraska	18.2	21.0	23.5	24.0	24.4	22.9	22.5	23.9	22.7	22.6	19.9	17.0
Kansas	19.4	22.0	23.8	25.3	25.1	24.7	24.1	24.5	24.4	22.7	19.2	18.0
Kentucky	20.5	22.6	24.9	26.5	26.7	26.0	27.2	27.6	24.1	25.1	22.2	20.8
Tennessee	20.1	22.1	25.1	26.8	27.8	26.9	25.7	26.6	24.2	23.8	21.4	20.5
Alabama	25.0	25.1	24.2	25.3	26.2	26.6	26.9	28.3	26.7	26.1	25.9	23.5
Mississippi	23.5	23.5	24.6	25.5	27.1	27.6	29.0	27.0	26.5	26.0	22.6	23.1
Louisiana	25.6	27.0	25.7	26.5	25.1	27.4	26.3	29.4	28.3	27.3	27.8	28.0
Texas	21.4	20.9	21.4	22.9	22.7	23.3	22.0	22.8	23.0	22.3	21.3	20.3
Oklahoma	19.2	20.9	22.1	24.1	23.2	23.9	23.1	23.2	23.0	22.3	20.6	19.2
Arkansas	18.9	20.9	21.3	19.8	23.2	23.8	23.3	24.5	22.2	21.5	23.2	19.0
Montana	20.0	16.1	21.9	21.0	22.6	24.3	21.6	21.9	24.8	25.4	21.0	19.0
Wyoming	24.4	15.0	24.5	24.9	24.3	27.2	28.7	26.2	26.8	26.7	26.0	23.0
Colorado	21.3	20.9	22.3	23.4	25.0	25.8	27.8	24.8	29.0	27.1	22.5	23.0
New Mexico	24.7	23.6	22.7	23.8	25.5	23.4	26.3	33.5	25.9	36.4	27.0	29.0
Arizona	36.0	40.0	32.5	36.7	37.5	33.2	32.5	36.7	37.5	40.0	30.0	33.0
Utah	23.3	20.2	21.8	21.4	24.0	22.9	19.2	19.2	21.8	22.2	22.0	22.1
Nevada	......	27.5	35.0	34.2	38.8	38.8	34.2	38.3	35.4	34.0	34.0	35.0
Idaho	21.3	20.5	21.1	23.6	22.2	22.9	22.9	21.7	22.6	22.5	19.1	19.0
Washington	24.6	25.3	26.6	27.6	29.8	30.9	26.4	25.0	26.3	25.8	23.2	23.0
Oregon	27.5	26.2	27.5	28.8	30.6	25.6	26.2	24.0	24.4	24.5	23.7	23.2
California	30.1	32.3	32.0	31.6	32.7	31.7	29.9	29.3	31.1	30.0	32.0	32.7
United States	29.6	24.1	25.4	26.8	27.4	27.2	27.0	27.4	26.7	26.4	23.4	22.1
1919	21.7	21.6	22.2	23.5	25.2	25.7	25.2	25.9	25.7	24.2	22.9	22.3
1918	17.9	18.8	19.9	19.8	19.8	20.0	21.2	22.6	22.8	23.1	22.4	21.8
1917	13.9	14.7	15.5	16.1	17.5	17.5	17.3	17.1	17.2	18.1	17.7	17.5
1916	11.4	11.9	12.2	12.6	13.2	13.5	13.8	13.8	13.9	14.3	14.3	14.2
1915	11.2	11.5	11.7	11.9	12.1	12.2	12.2	12.2	12.1	12.0	11.8	11.5
1914	11.5	11.7	12.1	12.3	12.5	12.5	12.7	12.8	12.7	12.5	11.9	11.3
1913	10.7	10.9	11.1	11.6	11.8	12.0	12.1	12.4	12.4	12.5	12.1	11.5
1912	9.8	10.3	10.5	10.8	11.1	11.1	11.0	11.3	11.3	11.5	11.2	10.8
1911	10.5	10.6	10.6	10.8	11.0	11.0	11.2	11.2	11.1	10.9	10.3	9.6
1910	10.9	11.1	11.6	11.9	12.4	12.4	12.3	12.2	11.9	11.6	11.3	10.6
1909	......	9.9	10.0	10.2	10.6	10.9	11.1	11.2	11.1	11.3	10.9	10.8

CHICKENS AND TURKEYS—Continued.

TABLE 256.—*Turkeys: Farm price, cents per pound, 15th of month, 1912–1920.*

Date.	1920–21	1919–20	1918–19	1917–18	1916–17	1915–16	1914–15	1913–14	1912–13
Oct. 15	30.0	26.6	23.9	20.0	17.0	13.7	14.1	14.6	13.6
Nov. 15	31.8	28.3	25.7	21.0	18.6	14.8	14.1	15.2	14.4
Dec. 15	33.0	31.1	27.0	23.0	19.6	15.5	14.5	15.5	14.8
Jan. 15	33.0	32.0	27.3	22.9	19.5	15.6	14.5	15.5	14.9

SHEEP AND WOOL.

TABLE 257.—*Sheep: Number and value on farms in the United States, 1867–1921.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of numbers are obtained by applying estimated percentages of increase or decrease to the published numbers of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available. It should also be observed that the census of 1910 giving numbers as of Apr. 15, is not strictly comparable with former censuses, which related to numbers June 1.

Jan. 1—	Number.	Price per head Jan. 1.	Farm value Jan. 1.
1867	39,385,000	$2.50	$98,644,000
1868	38,992,000	1.82	71,053,000
1869	37,724,000	1.64	62,037,000
1870	40,853,000	1.96	79,876,000
1870, census, June 1	*28,477,951*	....	....
1871	31,851,000	2.14	68,310,000
1872	31,679,000	2.61	82,768,000
1873	33,002,000	2.71	89,427,000
1874	33,938,000	2.43	82,353,000
1875	33,784,000	2.55	86,278,000
1876	35,935,000	2.37	85,121,000
1877	35,804,000	2.13	76,362,000
1878	35,740,000	2.21	78,898,000
1879	38,124,000	2.07	78,965,000
1880	40,766,000	2.21	90,231,000
1880, census, June 1	*35,192,074*	....	....
1881	43,570,000	2.39	104,071,000
1882	45,016,000	2.37	106,596,000
1883	49,237,000	2.53	124,366,000
1884	50,627,000	2.37	119,903,000
1885	50,360,000	2.14	107,961,000
1886	48,322,000	1.91	92,444,000
1887	44,759,000	2.01	89,873,000
1888	43,545,000	2.05	89,280,000
1889	42,599,000	2.13	90,640,000
1890	44,336,000	2.27	100,660,000
1890, census, June 1	*35,935,364*	....	....
1891	43,431,000	2.50	108,397,000
1892	44,938,000	2.58	116,121,000
1893	47,274,000	2.66	125,909,000
1894	45,048,000	$1.98	$89,186,000
1895	42,294,000	1.58	66,686,000
1896	38,299,000	1.70	65,168,000
1897	36,819,000	1.82	67,021,000
1898	37,657,000	2.46	92,721,000
1899	39,114,000	2.75	107,698,000
1900	41,883,000	2.93	122,666,000
1900, census, June 1	*61,503,713*	....	....
1901 [1]	59,757,000	2.98	178,072,000
1902	62,039,000	2.65	164,446,000
1903	63,965,000	2.63	168,316,000
1904	51,630,000	2.59	133,530,000
1905	45,170,000	2.82	127,332,000
1906	50,632,000	3.54	179,056,000
1907	53,240,000	3.84	204,210,000
1908	54,631,000	3.88	211,736,000
1909	56,084,000	3.43	192,632,000
1910	57,216,000	....	....
1910, census, Apr. 15	*52,447,861*	4.12	216,030,000
1911 [1]	53,633,000	3.91	209,535,000
1912	52,362,000	3.46	181,170,000
1913	51,482,000	3.94	202,779,000
1914	49,719,000	4.02	200,045,000
1915	49,956,000	4.50	224,687,000
1916	48,625,000	5.17	251,594,000
1917	47,616,000	7.13	339,529,000
1918	48,603,000	11.82	574,575,000
1919	48,866,000	11.63	568,265,000
1920	47,114,000	10.52	495,660,000
1921	45,067,000	6.41	288,732,000

[1] Estimates of numbers revised, based on census data.

SHEEP AND WOOL—Continued.

TABLE 258.—*Sheep: Number and value on farms Jan 1, 1919 and 1920, by States.*

State.	Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—	
	1921	1920	1921	1920	1921	1920
Maine	140	165	$5.60	$9.50	$784	$1,568
New Hampshire	31	37	7.30	9.80	226	363
Vermont	91	100	6.70	11.50	610	1,150
Massachusetts	28	28	9.50	12.70	266	356
Rhode Island	5	5	10.00	12.20	50	61
Connecticut	22	24	9.60	12.80	211	307
New York	745	810	7.60	12.40	5,662	10,044
New Jersey	29	30	10.70	11.00	310	330
Pennsylvania	856	930	7.60	11.60	6,506	10,788
Delaware	8	9	7.40	10.40	59	94
Maryland	220	245	8.10	10.90	1,782	2,670
Virginia	714	714	7.50	11.50	5,355	8,211
West Virginia	728	766	6.40	10.60	4,659	8,120
North Carolina	138	144	6.60	9.50	911	1,368
South Carolina	26	27	3.80	7.10	99	192
Georgia	119	125	4.10	4.90	488	612
Florida	89	95	3.60	5.20	320	494
Ohio	2,773	2,950	5.80	10.10	16,083	29,795
Indiana	960	1,067	6.70	11.80	6,432	12,591
Illinois	889	1,010	7.00	12.60	6,223	12,726
Michigan	2,135	2,224	6.90	11.80	14,732	26,243
Wisconsin	632	687	6.40	10.80	4,045	7,420
Minnesota	598	650	6.20	11.00	3,708	7,150
Iowa	948	1,019	6.90	12.00	6,541	12,228
Missouri	1,388	1,525	6.00	11.90	8,328	18,148
North Dakota	272	286	6.00	11.00	1,632	3,146
South Dakota	680	850	5.70	10.00	3,876	8,500
Nebraska	290	315	6.30	11.10	1,827	3,496
Kansas	405	506	6.10	11.60	2,470	5,870
Kentucky	1,137	1,236	6.30	10.90	7,163	13,472
Tennessee	526	560	5.60	10.50	2,946	5,880
Alabama	123	137	4.30	5.60	529	767
Mississippi	149	175	3.30	6.30	492	1,102
Louisiana	209	220	3.80	5.40	794	1,188
Texas	3,069	2,790	6.30	9.90	19,335	27,621
Oklahoma	110	110	6.30	11.10	693	1,221
Arkansas	191	201	4.10	7.40	783	1,487
Montana	2,450	2,330	5.80	10.30	14,210	23,999
Wyoming	3,040	3,200	6.30	10.20	19,152	32,640
Colorado	1,973	2,121	5.60	9.80	11,049	20,786
New Mexico	2,666	2,539	6.00	9.30	15,996	23,613
Arizona	1,200	1,200	6.60	9.60	7,920	11,520
Utah	2,245	2,245	6.80	9.80	15,266	22,001
Nevada	1,532	1,596	7.60	10.30	11,643	16,439
Idaho	2,623	2,914	6.20	10.40	16,263	30,306
Washington	645	725	7.10	11.00	4,580	7,975
Oregon	2,270	2,522	6.90	11.00	15,663	27,742
California	2,950	2,950	6.80	10.80	20,060	31,860
United States	45,067	47,114	6.41	10.52	288,732	495,660

SHEEP AND WOOL—Continued.

TABLE 259.—*Sheep: Farm price per 100 pounds, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15....	$9.34	$9.68	$10.55	$7.33	$5.52	$4.95	$4.67	$4.35	$3.89	$4.47	$6.48
Feb. 15....	9.97	9.95	10.75	8.17	5.90	5.14	4.67	4.63	4.01	4.34	6.75
Mar. 15....	10.25	10.45	11.41	9.21	6.35	5.36	4.77	4.97	4.12	4.45	7.13
Apr. 15....	10.66	11.33	11.98	9.69	6.61	5.60	4.96	5.16	4.57	4.55	7.51
May 15....	10.34	10.93	12.32	10.15	6.66	5.54	4.87	4.91	4.74	4.51	7.50
June 15....	9.13	10.34	11.56	9.84	6.54	5.43	4.70	4.84	4.52	4.24	7.11
July 15....	8.21	9.25	11.04	9.32	6.33	5.35	4.75	4.20	4.21	4.19	6.68
Aug. 15....	7.54	9.06	10.99	9.33	6.22	5.16	4.87	4.32	4.26	3.98	6.57
Sept. 15....	7.24	8.69	10.79	10.05	6.25	5.06	4.80	4.23	4.11	3.91	6.51
Oct. 15....	6.62	8.46	10.35	10.24	6.20	5.18	4.81	4.16	4.19	3.68	6.39
Nov. 15....	6.20	8.35	10.11	10.20	6.41	5.18	4.68	4.27	4.05	3.65	6.31
Dec. 15....	5.54	8.53	9.46	10.44	6.77	5.38	4.95	4.46	4.21	3.71	6.34

TABLE 260.—*Lambs: Farm price per 100 pounds, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15....	$12.91	$12.71	$13.83	$9.59	$7.29	$6.47	$6.16	$6.03	$5.22	$5.71	$8.59
Feb. 15....	14.08	13.17	13.77	10.51	7.78	6.67	6.18	6.34	5.15	5.44	8.91
Mar. 15....	14.17	14.03	14.11	11.46	8.10	6.06	6.31	6.56	5.38	5.49	9.17
Apr. 15....	14.63	14.61	15.34	12.03	8.58	7.35	6.47	6.59	5.98	5.77	9.74
May 15....	14.26	14.34	15.39	12.51	8.49	7.32	6.49	6.66	6.16	5.74	9.73
June 15....	12.82	13.89	14.98	12.64	8.36	7.26	6.47	6.36	6.02	5.51	9.43
July 15....	11.79	13.09	14.20	11.19	8.16	7.21	6.55	6.05	5.74	5.42	8.94
Aug. 15....	10.84	12.91	14.20	12.08	8.15	6.70	6.26	5.50	5.60	5.25	8.75
Sept. 15....	10.31	12.25	13.73	13.06	8.22	6.71	6.27	5.51	5.49	5.02	8.66
Oct. 15....	9.65	11.47	13.20	14.09	8.02	6.70	6.09	5.51	5.42	4.68	8.48
Nov. 15....	9.37	11.45	12.54	13.79	8.41	6.76	6.14	5.64	5.37	4.68	8.42
Dec. 15....	8.45	11.85	12.44	13.81	8.72	7.02	6.33	5.85	5.70	4.93	8.52

TABLE 261.—*Sheep: Imports, exports, and prices, 1893–1920.*

Year ending June 30—	Imports.			Exports.		
	Number.	Value.	Average import price.	Number.	Value.	Average export price.
1893	459,484	$1,682,977	$3.66	37,260	$126,394	$3.39
1894	242,568	788,181	3.25	132,370	832,763	6.29
1895	291,461	682,618	2.34	405,748	2,630,686	6.48
1896	322,692	853,530	2.65	491,565	3,076,384	6.26
1897	405,633	1,019,668	2.51	244,120	1,531,645	6.27
1898	392,314	1,106,322	2.82	199,690	1,213,886	6.08
1899	345,911	1,200,081	3.47	143,286	853,555	5.96
1900	381,792	1,365,026	3.58	125,772	733,477	5.83
1901	331,488	1,236,277	3.73	297,925	1,933,000	6.49
1902	266,953	956,710	3.58	358,720	1,940,060	5.41
1903	301,623	1,036,934	3.44	176,961	1,067,860	6.03
1904	238,094	815,289	3.42	301,313	1,954,604	6.49
1905	186,942	704,721	3.77	268,365	1,687,321	6.29
1906	240,747	1,020,359	4.24	142,690	804,090	5.64
1907	224,798	1,120,425	4.98	135,344	750,242	5.54
1908	224,765	1,082,606	4.82	101,000	589,285	5.83
1909	102,663	502,640	4.90	67,656	365,155	5.40
1910	126,152	696,879	5.52	44,517	209,000	4.69
1911	53,455	377,625	7.06	121,491	636,272	5.24
1912	23,588	157,257	6.67	157,263	626,985	3.99
1913	15,428	90,021	5.83	187,132	605,725	3.24
1914	223,719	532,404	2.38	152,600	534,543	3.50
1915	153,317	533,967	3.48	47,213	182,278	3.86
1916	235,659	917,502	3.89	52,278	231,535	4.43
1917	160,422	856,645	5.34	58,811	367,935	6.26
1918	177,681	1,979,746	11.14	7,959	97,028	12.19
1919	163,283	1,914,473	11.72	16,117	187,347	11.62
1920	199,549	2,279,949	11.43	59,155	711,549	12.03

SHEEP AND WOOL—Continued.

TABLE 262.—*Sheep: Wholesale price per 100 pounds, 1913–1920.*

[Compiled from commercial papers.]

Date.	Chicago, native.			Cincinnati, good to extra.			St. Louis, good to choice natives.			Kansas City, native.			Omaha, western.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
January–June	3.00	8.60	6.28	3.75	7.00	4.90	4.75	7.25	5.87	4.85	7.85	6.52	3.75	8.25	6.05
July–December	2.25	7.25	4.94	3.25	4.65	4.06	4.00	5.00	4.42	3.50	6.65	4.79	2.75	7.00	4.50
1914.															
January–June	4.00	7.75	5.96	4.10	6.15	5.03	5.00	6.50	5.82	4.25	7.25	6.00	4.25	7.50	6.41
July–December	4.25	8.10	6.08	4.00	5.25	4.81	4.50	5.75	5.20	3.40	7.00	5.52	4.25	8.00	5.65
1915.															
January–June	2.50	10.65	6.08	4.00	8.75	5.70	5.00	8.50	6.78	4.50	10.00	7.04	4.00	9.75	7.09
July–December	2.00	8.75	5.18	4.50	8.75	5.38	5.25	6.00	5.55	4.00	8.25	6.09	4.00	8.00	5.71
1916.															
January–June	4.25	10.90	7.71	3.75	8.75	6.90	6.50	8.85	7.96	5.00	11.50	8.40	4.50	11.00	8.13
July–December	3.00	10.25	5.80	5.25	8.50	5.33	7.25	9.00	7.44	6.00	11.75	7.96	5.50	11.75	7.46
1917.															
January–June	7.00	19.00	11.96	7.50	12.00	9.36	9.00	14.00	11.49	7.75	18.00	11.71	7.50	16.00	11.76
July–December	7.75	14.75	11.26	6.50	10.50	9.19	8.50	12.00	10.44	8.00	15.50	11.14	8.00	14.25	11.53
1918.															
January–June	6.00	19.75	12.91	9.00	15.50	11.46	10.00	18.00	13.40	10.50	19.00	14.21	10.00	18.75	13.94
July–December	6.00	16.60	10.61	6.00	12.50	9.67	7.00	13.50	9.74	7.00	17.00	11.23	7.00	14.50	11.00
1919.															
January–June	5.00	19.00	11.74	7.00	13.00	9.72	6.00	16.65	10.79	6.00	18.50	13.82	6.00	16.50	11.45
July–December	4.00	15.60	9.01	5.50	9.50	7.29	5.00	15.50	7.50	5.75	14.75	9.41	4.50	15.75	8.20
1920.															
January	9.50	17.75	12.04	8.50	9.50	9.12	10.50	19.50	14.26	9.00	18.25	12.98	6.25	18.25	12.03
February	11.50	15.25	13.56	10.00	10.50	10.25	10.75	19.50	14.45	11.50	18.25	14.60	8.00	18.00	12.32
March	12.00	16.50	13.59	10.00	11.50	10.50	12.00	16.00	13.74	11.50	18.00	14.59	8.25	18.00	13.20
April	11.00	17.15	13.86	11.00	14.00	12.68	12.00	16.00	13.40	11.50	18.00	14.74	12.00	18.50	15.43
May	10.00	14.50	12.41	12.00	14.00	12.75	9.00	13.00	10.97	8.00	17.50	11.98	8.00	17.50	12.02
June	6.00	10.00	7.92	6.50	10.00	8.06	6.50	9.00	7.68	6.50	13.00	9.39	5.00	12.50	8.55
January–June	6.00	17.75	12.23	6.50	14.00	10.56	6.50	19.50	12.42	6.50	18.25	13.05	5.00	18.50	12.26
July	5.00	10.25	8.15	6.00	9.00	7.38	4.00	10.00	7.11	6.50	12.00	8.38	4.50	10.50	7.42
August	7.00	9.50	7.73	5.50	8.75	6.84	6.00	9.00	7.79	6.00	10.00	7.92	4.00	10.25	6.71
September	5.50	8.25	6.59	6.00	6.50	6.25	5.00	7.00	6.07	5.00	10.00	7.68	4.25	9.25	6.78
October	4.50	8.60	6.26	4.50	6.50	5.19	5.00	6.00	5.52	4.50	10.00	6.91	4.00	10.50	6.72
November	4.00	9.00	5.35	3.50	6.00	4.75	4.00	9.00	5.30	4.00	11.50	7.42	4.00	11.25	6.85
December	3.50	5.25	4.31	4.00	5.50	4.65	3.25	7.50	4.35	1.00	8.00	4.22	3.25	10.00	6.01
July–December	3.50	10.25	6.40	3.50	9.00	5.84	3.25	10.00	6.02	1.00	12.00	7.09	3.25	11.25	6.75

SHEEP AND WOOL—Continued.

TABLE 263.—*Sheep: Percentage of the different breeds in the United States, by States.*

Estimates below are based upon the following inquiry of live-stock reporters: "Letting 100 represent the total number in your locality, what proportion of the total belongs to the breeds named? Grades and scrubs should be included in the breed in which the type predominates."

State.	Cheviot.	Cotswold.	Dorset.	Hampshire.	Leicester.	Lincoln.	Merino.	Oxford Down.	Rambouillet.	Shropshire.	Southdown.	Tunis.	Other.	Nondescript.
Maine	2.5	4.0	8.5	11.6	2.0	0.2	2.8	15.0	0.5	24.8	16.1	0.1	3.5	8.4
New Hampshire	3.0	2.2	1.5	5.6	1.8	1.0	3.4	2.6	.9	40.2	13.3	.1	3.5	20.9
Vermont	2.9	8.5	6.0	4.0	1.4	.6	6.3	.6	1.5	48.0	11.1	.1	2.4	6.6
Massachusetts	3.0	2.4	2.9	4.0	1.2	1.0	6.2	.7	1.8	46.0	29.3	.....	.7	.8
Rhode Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	60.0	3.3	.....	5.0	31.7
Connecticut	9.3	2.0	.5	2.0	.....	.....	1.2	.2	.3	26.6	38.8	.....	.....	19.1
New York	2.1	3.4	3.6	8.8	1.1	1.2	8.2	3.2	4.4	44.2	7.6	.3	1.9	10.0
New Jersey	.3	1.4	13.1	3.6	.4	.4	10.8	1.6	.....	12.7	34.7	.....	5.0	16.0
Pennsylvania	.2	3.3	2.0	4.6	.9	1.0	27.5	2.4	.3	22.6	17.8	.....	2.4	15.0
Delaware	.....	.6	.4	.4	.....	.....	1.0	.....	.2	.8	82.3	.9	11.3	2.1
Maryland	.9	3.5	3.4	3.4	.3	.7	3.3	.8	.1	26.1	27.9	.....	7.0	22.6
Virginia	.2	4.0	5.2	10.4	.....	.3	2.6	.7	.2	35.6	25.2	.....	4.6	11.0
West Virginia	2.0	3.0	5.1	6.7	.4	1.3	11.5	1.4	.3	29.0	25.9	.1	2.5	10.8
North Carolina	.1	4.0	.1	8.1	.....	.1	4.4	.4	.7	30.2	22.3	.....	5.4	24.2
South Carolina	.....	.....	4.7	6.7	.....	.....	8.4	.....	1.9	7.2	27.4	.....	2.9	40.8
Georgia	.....	.3	.....	.1	.....	.....	3.4	.....	14.9	9.5	41.0	.....	22.3	8.5
Florida	.....	.....	.....	2.9	.....	.....	.6	.6	.....	.6	1.7	.....	.....	93.6
Ohio	.1	2.2	1.8	4.0	.3	1.2	35.7	2.3	2.8	30.2	7.2	.1	4.8	7.3
Indiana	1.4	8.3	1.4	4.8	.....	.9	8.0	5.1	1.1	49.7	10.7	.1	3.3	5.2
Illinois	.5	12.4	.6	6.7	.3	2.1	7.0	4.4	1.3	44.6	8.0	.1	5.7	6.3
Michigan	1.1	2.0	.4	8.6	2.3	3.8	11.1	6.9	6.0	46.8	2.8	.1	4.0	4.1
Wisconsin	.4	3.5	.2	3.6	.2	3.1	4.4	7.4	1.0	57.1	5.1	.1	5.5	8.4
Minnesota	.2	3.5	.1	7.8	.2	1.0	3.7	3.4	.2	65.1	4.0	.2	4.0	6.6
Iowa	.3	9.1	.4	4.7	.3	1.8	7.7	3.2	1.3	59.8	4.2	.....	3.0	4.2
Missouri	.4	9.6	.5	7.7	.3	.6	8.7	4.2	2.4	48.2	7.1	.....	3.5	6.8
North Dakota	.2	5.9	1.0	6.9	.2	1.6	8.3	2.4	9.5	44.7	1.5	.1	2.4	15.3
South Dakota	.3	6.9	.4	6.4	.1	2.0	13.2	.6	26.0	29.9	2.7	.1	6.9	4.5
Nebraska	.2	10.2	3.1	7.5	1.0	3.4	8.7	3.0	5.8	38.6	4.2	.2	9.1	5.0
Kansas	.....	7.8	.2	4.2	.4	1.2	23.2	1.6	3.3	40.5	3.6	.....	7.1	6.9
Kentucky	.2	5.2	.7	12.2	.2	.7	5.8	1.7	.1	14.1	35.1	.....	6.3	17.7
Tennessee	.....	6.8	1.3	7.8	.1	.2	2.0	1.1	.3	14.9	44.8	.4	6.3	14.0
Alabama	.....	3.8	.2	4.1	.....	.2	13.5	.5	6.4	1.8	44.0	2.9	16.1	6.5
Mississippi	.....	.3	1.9	2.7	.....	.....	4.2	.5	3.9	9.1	34.3	.....	17.5	25.6
Louisiana	.....	.6	.3	.8	.....	.....	10.1	4.2	1.6	4.6	10.5	.....	1.9	65.4
Texas	.1	1.2	.....	5.9	.1	1.6	29.2	.....	29.1	17.3	2.1	.2	6.6	6.6
Oklahoma	.....	1.7	.8	1.8	.7	.6	19.1	.8	6.0	46.6	9.2	.....	3.4	9.3
Arkansas	1.0	4.9	.3	5.3	.1	4.1	9.0	.8	.7	18.8	17.6	.3	9.0	28.1
Montana	.....	8.4	.....	9.7	.....	3.9	21.8	1.3	24.6	11.5	.2	.....	2.9	15.7
Wyoming	.4	13.4	.....	2.8	.5	6.8	21.6	3.5	27.2	11.0	.4	.3	6.5	5.6
Colorado	.....	7.6	.....	8.9	.....	.8	29.6	.9	28.9	18.2	.8	.....	1.7	2.6
New Mexico	.....	.8	.....	.3	.....	.7	66.5	1.1	14.6	3.3	.....	.....	.1	12.6
Arizona	.....	.....	.....	.....	.....	.....	100.0	.....	.....	.....	.....	.....	.....	.....
Utah	.....	22.2	1.0	2.6	.....	2.6	22.6	.....	34.1	2.5	.8	.....	2.9	8.7
Nevada	.....	7.2	.....	3.5	.....	1.1	61.1	.....	20.8	5.8	.....	.....	.....	.5
Idaho	.....	15.0	.....	21.0	.....	7.4	17.2	1.2	12.2	18.8	1.0	.....	2.0	4.2
Washington	.1	2.3	.4	9.2	.....	21.3	15.3	2.8	24.7	13.8	1.8	.....	2.8	5.5
Oregon	.....	12.7	.4	1.1	.....	23.9	22.4	.1	16.8	12.1	4.1	.....	.6	5.8
California	.1	4.4	.7	1.0	.1	2.2	40.7	.2	10.4	25.1	7.3	.....	1.2	6.6
United States	.3	7.2	.7	6.1	.3	3.8	25.4	1.9	13.3	23.2	6.1	.1	3.5	8.1
North Atlantic	1.4	3.6	3.5	6.7	1.1	1.0	15.8	3.6	1.9	32.8	14.0	.1	2.3	12.2
South Atlantic	.9	3.1	4.0	7.0	.2	.7	6.0	.9	1.1	28.0	25.6	.....	5.0	17.5
N.C. east Miss. R	.6	4.4	1.1	5.7	.8	2.1	18.8	4.7	3.1	41.6	6.4	.1	4.5	6.1
N.C. west Miss. R	.3	8.0	.6	6.4	.3	1.4	9.9	2.9	6.2	48.7	4.5	.1	4.6	6.1
South Central	.1	2.9	.4	7.0	.1	1.2	18.1	.8	15.4	15.9	17.2	.2	6.9	13.8
Far Western	.1	9.5	.2	5.8	.1	6.0	35.0	1.0	19.6	12.1	1.7	.....	2.1	6.8

SHEEP AND WOOL—Continued.

TABLE 264.—*Wool: Estimated production, 1919 and 1920.*

State.	Production (000 omitted).		Weight per fleece.		Number of fleeces (000 omitted).	
	1920	1919	1920	1919	1920	1919
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Number.*	*Number.*
Maine	973	936	6.4	6.4	152	146
New Hampshire	204	202	6.5	6.6	31	31
Vermont	676	690	7.2	7.2	94	96
Massachusetts	131	125	6.5	6.6	20	19
Rhode Island	23	25	6.1	5.8	4	4
Connecticut	96	84	5.6	5.9	17	14
New York	4,083	4,022	6.9	7.0	592	575
New Jersey	109	106	7.0	7.0	16	15
Pennsylvania	4,560	4,863	6.5	7.0	702	655
Delaware	32	31	5.8	5.7	6	5
Maryland	825	812	6.0	6.0	138	135
Virginia	1,680	1,715	4.6	5.0	365	343
West Virginia	3,200	3,150	5.0	5.3	640	591
North Carolina	575	587	4.2	4.4	137	133
South Carolina	103	103	4.5	4.3	23	24
Georgia	418	422	3.2	3.1	131	136
Florida	391	407	3.2	3.5	122	116
Ohio	12,449	13,101	7.4	7.5	1,682	1,747
Indiana	5,306	5,337	7.0	7.4	758	721
Illinois	3,923	4,129	7.8	8.0	503	516
Michigan	10,223	9,554	7.6	7.4	1,345	1,291
Wisconsin	3,360	3,310	7.4	7.6	454	436
Minnesota	3,536	3,594	7.1	7.5	498	479
Iowa	4,908	5,060	7.7	8.0	637	632
Missouri	8,296	8,492	6.8	7.1	1,220	1,196
North Dakota	1,737	1,654	7.5	7.7	232	215
South Dakota	4,804	5,222	7.0	7.5	686	696
Nebraska	1,886	1,730	8.0	7.9	236	219
Kansas	2,087	1,754	7.5	7.6	278	231
Kentucky	3,115	3,211	5.0	5.2	623	618
Tennessee	2,052	2,052	4.8	4.8	428	428
Alabama	364	405	4.0	4.2	91	96
Mississippi	550	656	3.6	4.2	153	156
Louisiana	612	612	3.9	3.9	157	157
Texas	17,600	14,986	7.0	7.2	2,514	2,081
Oklahoma	526	526	7.2	7.0	73	75
Arkansas	443	422	4.5	4.9	98	86
Montana	15,800	17,450	7.9	8.4	2,000	2,077
Wyoming	28,422	31,580	8.3	8.5	3,424	3,715
Colorado	8,181	8,800	6.7	6.6	1,221	1,333
New Mexico	15,528	15,076	6.3	6.3	2,465	2,393
Arizona	5,970	5,580	6.5	6.3	918	885
Utah	16,150	17,000	7.8	7.4	2,071	2,297
Nevada	9,000	10,500	7.3	7.6	1,233	1,382
Idaho	21,702	22,145	8.1	8.4	2,679	2,636
Washington	5,490	5,779	8.7	8.6	631	672
Oregon	14,040	14,040	8.4	8.5	1,671	1,652
California	13,165	13,298	7.6	7.4	1,732	1,797
United States	259,307	265,338	7.2	7.4	35,901	35,956
Pulled wool	42,900	48,300				

SHEEP AND WOOL—Continued.

TABLE 265.—*Wool (unwashed): Farm price per pound, 15th of month, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Jan. 15	53.3	55.2	58.1	31.8	23.3	18.6	15.7	18.6	16.2	17.3	30.8
Feb. 15	52.5	51.1	57.1	32.7	24.2	20.2	15.7	18.7	16.3	17.3	30.6
Mar. 15	51.5	51.3	60.0	36.7	25.9	22.8	16.4	18.4	16.9	16.8	31.7
Apr. 15	51.3	47.9	60.0	38.8	26.3	22.7	16.8	17.7	17.3	15.7	31.4
May 15	50.3	48.0	58.2	43.7	28.0	22.0	17.2	16.3	17.8	14.7	31.6
June 15	38.6	50.5	57.4	49.8	28.7	23.7	18.4	15.6	18.7	15.5	31.7
July 15	29.5	51.8	57.5	54.3	28.6	24.2	18.5	15.9	18.9	15.4	31.5
Aug. 15	28.3	52.2	57.4	54.8	29.0	23.8	18.7	15.8	18.8	16.0	31.5
Sept. 15	28.0	51.3	57.7	54.2	28.4	23.3	18.6	15.8	18.7	15.6	31.2
Oct. 15	27.5	50.6	57.7	55.5	28.7	22.7	18.0	15.5	18.5	15.5	31.0
Nov. 15	24.9	51.0	56.4	55.9	29.4	22.7	18.1	15.6	18.6	15.6	30.8
Dec. 15	21.9	51.6	56.2	58.2	30.8	23.3	18.6	16.1	18.6	15.5	31.1

TABLE 266.—*Wool: Wholesale price per pound in Boston, 1913–1920.*

[Compiled from commercial papers.]

Date.	Ohio fine, unwashed.			Kentucky quarter blood, unwashed.			Ohio XX, washed.			Ohio half-blood combing, washed.			Ohio Delaine, washed.			Michigan fine, unwashed.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January–June	20	24	22.4	24	32	28.6	27	32	29.4	23	29	26.6	27	34	30.8	19	23	21.1
July–December	20	21	20.5	23½	26	24.2	25	30	26.5	23	25	23.9	26	28	27.3	19	20	19.5
1914.																		
January–June	20	25	22.3	23½	27	24.5	25½	29	27.0	23	28	25.0	26	32	28.2	19	23	21.0
July–December	23	25	24.3	26	29	27.0	27	31½	29.6	27	30	28.3	28	32	30.9	22	23	22.8
1915.																		
January–June	23	29	26.7	29	39	35.5	29	34	32.0	29	38	34.0	30	37	33.4	22	26	23.8
July–December	25	27½	26.9	36	39½	38.0	32	32½	32.1	32½	36	34.4	33½	36	34.5	23	27½	23.8
1916.																		
January–June	26	31	29.6	38	41	39.4	32½	35	33.7	32	38	36.1	35½	40	37.6	25	28	26.9
July–December	30	38	32.6	41	50	44.6	35	47	37.5	37	46	40.9	38	52	41.9	27	37	29.8
1917.																		
January–June	38	58	46.5	50	76	59.0	46	68	55.0	45	71	55.4	52	82	60.8	37	57	44.0
July–December	57	67	63.5	75	77	76.7	67	80	75.0	71	78	75.3	80	85	82.6	56	64	60.3
1918.																		
January–June	61	67	65.0	76	78	76.8	76	78	76.8	75	79	77.4	83	90	85.9	61	64	63.0
July–December	61	67	63.5	76	78	76.7	77	78	77.7	....	....	....	87	90	89.0	61	64	62.7
1919.																		
January–June	52	62	55.4	55	80	63.4	67	71	68.0	65	75	68.0	67	88	73.6	52	60	54.7
July–December	61	72	65.1	66	72	68.2	70	76	72.1	73	85	80.3	85	102	92.6	59	68	63.3
1920.																		
January	70	72	71.0	67	70	67.8	75	76	75.5	85	85	85.0	100	102	101.0	67	68	67.5
February	73	75	74.0	68	70	69.0	75	76	75.5	83	85	84.0	105	110	107.5	68	72	70.0
March	73	76	74.8	67	70	67.9	(1)	(1)	(1)	83	85	84.0	97	100	98.5	68	73	71.1
April	74	76	75.0	67	68	67.5	(1)	(1)	(1)	83	85	84.0	97	100	98.5	70	73	71.5
May	70	76	72.5	62	68	64.9	(1)	(1)	(1)	75	85	81.4	88	100	95.0	66	73	70.1
June	60	65	62.9	58	60	59.0	(1)	(1)	(1)	68	72	70.5	70	75	72.4	58	60	59.8
January–June	60	76	71.7	58	70	66.0	75	76	75.5	68	85	81.5	70	110	95.5	58	73	68.3
July	60	62	61.0	....	....	....	(1)	(1)	(1)	68	70	69.0	70	72	71.0	58	60	59.0
August	55	62	59.2	....	....	....	(1)	(1)	(1)	63	70	66.5	68	70	69.8	52	60	56.2
September	50	57	53.0	43	45	44.0	(1)	(1)	(1)	57	62	59.6	60	65	62.5	50	52	51.0
October	48	57	49.5	40	44	44.1	(1)	(1)	(1)	50	58	54.5	60	65	60.5	45	52	47.0
November	36	37	38.6	30	37	32.4	(1)	(1)	(1)	40	47	42.9	50	55	51.8	35	47	39.4
December	30	37	32.0	26	31	28.6	(1)	(1)	(1)	33	40	35.5	45	50	47.4	29	36	31.0
July–December	30	62	48.9	26	45	37.3	(1)	(1)	(1)	33	70	54.7	45	72	60.5	29	60	47.3

[1] Unwashed after Mar. 6, 1920.

SHEEP AND WOOL—Continued.

TABLE 266.—*Wool: Wholesale price per pound in Boston, 1913–1920*—Continued.

Date.	Fine territory, staple scoured.			Fine medium territory, clothing scoured.			Texas, 12 months, scoured.			Fine fall, Texas scoured.			Pulled A, super-scoured.			Pulled B, super-scoured.		
	Low.	High.	Av.	Low.	High.	Av.	Low.	High.	Av.	Low.	High.	Av.	Low.	High.	Av.	Low.	High.	Av.
1913.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
January-June	55	67	59.5	49	59	53.8	52	65	58.4	45	50	47.6	48	58	52.8	43	54	47.0
July-December	51	56	53.9	46	50	48.3	50	53	51.8	41	46	44.4	42	52	48.4	36	45	40.7
1914.																		
January-June	51	63	57.2	46	55	51.2	50	62	55.5	41	50	45.0	43	53	49.3	36	43	40.7
July-December	60	65	62.7	55	57	56.0	55	62	59.1	42	50	47.2	50	55	51.6	40	56	45.9
1915.																		
January-June	62	75	70.0	55	68	63.8	56	75	67.7	42	60	55.3	56	68	61.5	57	74	62.8
July-December	70	75	72.6	63	68	65.0	65	70	67.9	54	57	55.8	60	66	63.6	55	65	61.4
1916.																		
January-June	73	85	79.8	65	75	71.7	67	77	72.6	53	55	54.5	63	68	66.2	59	66	62.4
July-December	82	112	93.0	75	87	78.8	77	100	84.9	55	78	60.8	65	85	70.0	60	80	67.5
1917.																		
January-June	110	175	135.9	85	135	107.5	100	175	127.0	75	120	88.8	83	150	114.5	75	140	104.0
July-December	172	185	180.0	135	160	153.6	165	175	169.3	115	150	135.0	145	165	157.5	130	150	142.2
1918.																		
January-June	180	190	183.5	155	160	157.5	168	175	171.6	140	155	147.9	145	165	160.9	140	155	148.6
July-December	180	185	181.7	....	....	.....	175	175	175.0	150	150	150.0	155	160	157.5	145	150	147.5
1919.																		
January-June	145	180	159.8	130	143	136.8	135	160	145.4	110	122	116.3	125	160	142.2	105	130	116.1
July-December	175	205	187.5	130	170	146.4	160	190	169.5	110	155	122.2	155	170	161.1	110	135	123.5
1920.																		
January	195	205	200.0	160	170	165.0	190	195	191.5	150	155	152.5	165	175	168.5	120	135	126.0
February	205	215	210.0	165	175	170.0	190	195	192.5	150	155	152.5	165	175	170.0	120	130	125.0
March	205	215	210.0	165	175	170.0	190	195	192.5	150	155	152.5	165	175	170.0	120	130	125.0
April	205	215	210.0	165	175	170.0	190	195	192.5	150	155	152.5	165	175	170.0	120	130	124.4
May	190	215	206.0	150	175	164.0	160	195	182.5	135	155	148.0	145	175	162.5	105	125	118.5
June	170	190	178.1	145	150	148.1	160	170	166.2	135	140	135.5	145	150	147.5	85	100	91.4
January-June	170	215	202.4	145	175	164.5	160	195	186.3	135	155	149.2	145	175	164.8	85	135	118.9
July	165	170	169.0	125	150	144.0	150	165	161.0	115	140	131.5	130	140	135.0	85	90	87.5
August	155	165	163.1	125	130	127.5	150	160	153.8	115	120	117.5	95	140	118.0	70	90	78.8
September	135	160	145.6	100	110	106.2	130	150	135.6	100	115	105.0	95	115	105.4	65	75	71.2
October	105	140	120.5	75	105	87.0	90	130	108.0	70	105	79.5	65	95	81.0	50	65	56.5
November	100	110	103.8	55	75	65.0	90	100	93.8	55	63	59.1	60	70	63.8	40	55	46.4
December	80	100	85.6	50	60	54.8	75	80	76.2	45	55	49.4	50	65	58.8	35	45	41.2
July-December	80	170	131.3	50	150	97.4	75	165	121.4	45	140	90.3	50	140	93.7	35	90	63.6

SHEEP AND WOOL—Continued.

TABLE 267.—*Wool: Wholesale price per pound, 1913–1920.*

[Compiled from commercial papers.]

Date.	Boston, Ohio XX washed.			Philadelphia, Ohio XX washed.[1]			St. Louis, best tub washed.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January–June	27	32	29.4	24	31	....	28	37	32.5
July–December	25	30	26.5	22	25	....	28	35	28.7
1914.									
January–June	25½	29	27.0	22	28	....	28	33	29.6
July–December	27	31½	29.6	25	29	....	31	33	31.6
1915.									
January–June	29	34	32.0	29	34	31.7	31	41	37.6
July–December	32	32½	33.2	28	33½	33.1	40	44	40.6
1916.									
January–June	32½	35	33.7	32½	37	33.6	42	48	44.3
July–December	34	47	37.5	34	44	36.9	47	49	47.7
1917.									
January–June	46	68	55.0	44	74	....	48	75	56.5
July–December	67	80	75.0	73	78	....	75	85	81.4
1918.									
January–June	76	78	76.8	72	76	....	83	90	86.0
July–December	77	78	77.7	(2)	(2)	(2)	90	91	90.9
1919.									
January–June	67	71	68.0	61	85	....	60	77	69.8
July–December	70	76	72.1	(2)	(2)	(2)	70	80	73.8
1920.									
January	75	76	75.5	100	102	101	70	70	70.0
February	75	76	75.5	105	110	107	70	70	70.0
March	(2)	(2)	(2)	97	100	98	70	70	70.0
April	(2)	(2)	(2)	97	100	98	65	70	65.2
May	(2)	(2)	(2)	88	100	94	50	65	58.0
June	(2)	(2)	(2)	70	75	73	40	50	45.4
January–June	75	76	75.5	70	110	95.2	40	70	63.1
July	(2)	(2)	(2)	70	72	71	40	40	40.0
August	(2)	(2)	(2)	68	70	69	40	40	40.0
September	(2)	(2)	(2)	60	65	63	40	49	41.1
October	(2)	(2)	(2)	60	65	62	35	40	37.1
November	(2)	(2)	(2)	50	55	53	30	35	34.2
December	(2)	(2)	(2)	45	50	48	30	30	30.0
July–December	(2)	(2)	(2)	45	72	61.0	30	49	37.1

[1] Delaine, unwashed, 1920.

[2] No quotations.

SHEEP AND WOOL—Continued.

TABLE 268.—*Wool: International trade, calendar years 1909–1919.*[1]

["Wool" on this table includes: Washed, unwashed, scoured, and pulled wool; slipe, sheep's wool on skins (total weight of wool and skins taken); and all other animal fibers included in United States classification of wool. The following items have been considered as not within this classification: Corded, combed, and dyed wool; flocks, goatskins with hair on, mill waste, noils, and tops. See "General notes," Table 230.]

EXPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
From—	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*	*1,000 pounds.*
Algeria	19,871	18,706	28,336	18,348	9,565	10,269	16,876
Argentina	328,204	258,533	259,415	259,387	298,773	256,613	....
Australia	676,679	576,353	530,258	406,287	321,370	607,585	....
Belgium	196,440	....	....	....	....	....	30,041
British India	56,406	44,705	59,694	53,074	44,479	41,501	36,104
British South Africa	164,651	152,867	186,346	143,802	121,374	135,296	201,891
Chile	28,223	27,043	31,315	30,825	29,734	....	....
China	42,684	45,072	55,868	44,980	51,564	49,195	56,705
France	84,973	68,040	11,755	22,084	11,118	907	8,478
Germany	42,817	....	....	....	....	....	....
Netherlands	26,362	10,807	97	155	....	....	3,783
New Zealand	194,801	227,148	200,102	188,590	178,290	108,725	....
Persia	10,023	9,447	....	....	....	....	....
Peru	9,333	10,665	13,007	13,651	15,248	14,914	11,593
Russia	32,406	16,482	6,157	7,403	....	....	....
Spain	28,505	27,810	12,220	11,669	18,361	8,444	19,095
United Kingdom	42,027	38,848	32,151	13,403	6,996	2,347	18,463
Uruguay	139,178	98,298	83,563	67,465	87,330	....	....
Other countries	67,232	26,273	28,398	25,386	23,102	18,223	....
Total	2,190,905	1,657,097	1,538,682	1,306,509	1,217,304	1,254,019	....

IMPORTS.

Country.	Average, 1909–1913.	1914	1915	1916	1917	1918	1919
Into—							
Austria-Hungary	63,942	....	....	....	....	....	....
Belgium	300,307	....	....	....	....	....	101,159
British India	23,721	22,749	39,286	31,289	29,513	29,495	27,344
Canada	7,794	9,518	16,611	19,921	11,744	19,396	8,035
France	601,628	457,059	144,577	172,753	134,362	89,661	347,690
Germany	481,988	....	....	....	....	....	....
Japan	10,223	12,736	52,771	40,758	47,305	49,590	....
Netherlands	31,991	17,323	15,715	12,696	8,536	274	16,303
Russia	106,184	97,763	46,109	19,609	....	....	....
Sweden	7,267	4,669	10,142	14,124	2,951	754	17,816
Switzerland	11,211	9,152	17,414	29,121	19,363	7,959	10,249
United Kingdom	550,931	498,192	889,133	634,640	636,195	444,687	987,411
United States	203,298	260,165	412,721	449,190	420,995	453,727	445,893
Other countries	58,275	50,269	162,944	167,853	96,805	111,600	....
Total	2,458,820	1,439,595	1,807,423	1,591,954	1,407,769	1,206,543	....

[1] Does not include statistics of trade for Austria-Hungary, Belgium, and Germany during the war period, 1914–1918. Therefore the total trade statistics of imports and exports for all countries are not strictly comparable during that period.

SWINE.

TABLE 269.—*Swine: Number and value on farms in the United States, 1867–1921.*

NOTE.—Figures in *italics* are census returns; figures in roman are estimates of the Department of Agriculture. Estimates of numbers are obtained by applying estimated percentages of increase or decrease to the published numbers of the preceding year, except that a revised base is used for applying percentage estimates whenever new census data are available. It should also be observed that the census of 1910, giving numbers as of Apr. 15, is not strictly comparable with former censuses, which related to numbers June 1.

Jan. 1—	Number.	Price per head Jan. 1.	Farm value Jan. 1.
1867	24,694,000	$4.03	$99,637,000
1868	24,317,000	3.29	79,076,000
1869	23,316,000	4.65	108,431,000
1870	26,751,000	5.80	155,108,000
1870, census, June 1	*25,134,569*		
1871	29,458,000	5.61	165,312,000
1872	31,796,000	4.01	127,453,000
1873	32,632,000	3.67	119,632,000
1874	30,861,000	3.98	122,695,000
1875	28,062,000	4.80	134,581,000
1876	25,727,000	6.00	154,251,000
1877	28,077,000	5.66	158,873,000
1878	32,262,000	4.85	156,577,000
1879	34,766,000	3.18	110,508,000
1880	34,034,000	4.28	145,782,000
1880, census, June 1	*47,681,700*		
1881	36,248,000	4.70	170,535,000
1882	44,122,000	5.97	263,543,000
1883	43,270,000	6.75	291,951,000
1884	44,201,000	5.57	246,301,000
1885	45,143,000	5.02	226,402,000
1886	46,092,000	4.26	196,570,000
1887	44,613,000	4.48	200,043,000
1888	44,347,000	4.98	220,811,000
1889	50,302,000	5.79	291,307,000
1890	51,603,000	4.72	243,418,000
1890, census, June 1	*57,409,583*		
1891	50,625,000	4.15	210,194,000
1892	52,398,000	4.60	241,031,000
1893	46,095,000	6.41	295,426,000
1894	45,206,000	$5.98	$270,385,000
1895	44,166,000	4.97	219,501,000
1896	42,843,000	4.35	186,530,000
1897	40,600,000	4.10	166,273,000
1898	39,760,000	4.39	174,351,000
1899	38,652,000	4.40	170,110,000
1900	37,079,000	5.00	185,472,000
1900, census, June 1	*62,868,041*		
1901 [1]	56,982,000	6.20	353,012,000
1902	48,699,000	7.03	342,121,000
1903	46,923,000	7.78	364,974,000
1904	47,009,000	6.15	289,225,000
1905	47,321,000	5.99	283,255,000
1906	52,103,000	6.18	321,803,000
1907	54,794,000	7.62	417,791,000
1908	56,084,000	6.05	339,030,000
1909	54,147,000	6.55	354,794,000
1910	47,782,000		
1910, census, Apr. 15	*58,185,676*	9.17	533,309,000
1911 [1]	65,620,000	9.37	615,170,000
1912	65,410,000	8.00	523,328,000
1913	61,178,000	9.86	603,109,000
1914	58,933,000	10.40	612,951,000
1915	64,618,000	9.87	637,479,000
1916	67,766,000	8.40	569,573,000
1917	67,503,000	11.75	792,898,000
1918	70,978,000	19.54	1,387,261,000
1919	74,584,000	22.02	1,642,598,000
1920	71,727,000	19.01	1,363,269,000
1921	66,649,000	12.99	865,633,000

[1] Estimates of numbers revised, based on census data.

SWINE—Continued.

TABLE 270.—*Swine: Number and value on farms Jan. 1, 1920 and 1921, by States.*

State.	Number (thousands) Jan. 1—		Average price per head Jan. 1—		Farm value (thousands of dollars) Jan. 1—	
	1921	1920	1921	1920	1921	1920
Maine	97	110	$21.00	$24.50	2,037	2,695
New Hampshire	57	65	20.00	24.00	1,140	1,560
Vermont	105	115	14.80	22.50	1,554	2,588
Massachusetts	130	150	20.50	27.00	2,665	4,050
Rhode Island	13	15	21.00	30.00	273	450
Connecticut	78	87	20.00	27.50	1,560	2,392
New York	781	840	17.50	22.50	13,668	18,900
New Jersey	182	200	20.00	25.20	3,640	5,040
Pennsylvania	1,339	1,395	17.50	23.70	23,432	33,062
Delaware	68	73	16.00	19.00	1,088	1,387
Maryland	427	450	13.00	19.00	5,551	8,550
Virginia	1,026	1,115	11.50	15.00	11,799	16,725
West Virginia	425	443	14.00	18.00	5,950	7,974
North Carolina	1,528	1,575	15.70	20.00	23,990	31,500
South Caolina	1,099	1,088	13.50	21.50	14 836	23,392
Georgia	3,102	3,165	11.50	16.90	35,673	53,488
Florida	1,493	1,588	10.00	13.00	14,930	20,644
Ohio	3,921	4,309	13.30	19.20	52,149	82,733
Indiana	4,209	4,575	13.00	19.00	54,717	86,925
Illinois	4,585	5,152	13.70	20.50	62,814	105,616
Michigan	1,435	1,450	14.30	22.00	20,520	31,900
Wisconsin	2,236	2,236	14.50	23.50	32,422	52,546
Minnesota	2,803	2,951	15.30	24.00	42,886	70,824
Iowa	9,510	10,010	14.50	21.80	137,895	218,218
Missouri	4,047	4,305	11.00	16.50	44,517	71,032
North Dakota	402	428	14.00	21.00	5,628	8,988
South Dakota	1,525	1,695	13.50	21.50	20,588	36,442
Nebraska	3,063	3,366	13.50	20.90	41,350	70,349
Kansas	1,810	1,905	12.00	17.50	21,720	33,338
Kentucky	1,429	1,681	9.90	13.00	14,147	21,853
Tennessee	1,636	1,925	9.50	15.00	15,542	28,875
Alabama	1,861	2,190	10.00	12.80	18,610	28,032
Mississippi	1,783	2,050	9.50	14.50	16,938	29,725
Louisiana	1,250	1,420	11.70	14.30	14,625	20,306
Texas	2,427	2,356	11.80	19.50	28,639	45,942
Oklahoma	836	950	10.50	15.10	8,611	14,345
Arkansas	1,459	1,586	8.30	12.50	12,839	19,825
Montana	200	175	16.80	20.00	3,300	3,500
Wyoming	57	60	14.00	18.40	798	1,104
Colorado	325	382	12.30	18.00	3,998	6,876
New Mexico	85	83	15.00	21.80	1,275	1,809
Arizona	40	42	16.00	18.00	640	756
Utah	103	114	13.00	15.00	1,339	1,710
Nevada	30	32	11.00	14.00	330	448
Idaho	163	190	12.50	17.80	2,038	3,382
Washington	267	300	15.00	23.30	4,005	6,990
Oregon	272	302	12.80	19.50	3,482	5,889
California	930	1,033	14.50	18.00	13,485	18,594
United States	66,649	71,727	12.99	19.01	865,633	1,363,209

TABLE 271.—*Hogs: Farm price per 100 pounds, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	$13.36	$15.69	$15.26	$9.16	$6.32	$6.57	$7.45	$6.77	$5.74	$7.44	$9.38
Feb. 15	13.62	15.53	15.03	10.33	7.07	6.34	7.75	7.17	5.79	7.04	9.57
Mar. 15	13.59	16.13	15.58	12.32	7.86	6.33	7.80	7.62	5.94	6.74	9.99
Apr 15	13.73	17.39	15.76	13.61	8.21	6.48	7.80	7.94	6.78	6.17	10.39
May 15	13.44	18.00	15.84	13.72	8.37	6.77	7.60	7.45	6.79	5.72	10.37
June 15	13.18	17.80	15.37	13.50	8.21	6.80	7.43	7.61	6.65	5.66	10.22
July 15	13.65	19.22	15.58	13.35	8.40	6.84	7.72	7.81	6.64	5.92	10.51
Aug. 15	13.59	19.30	16.89	14.24	8.61	6.61	8.11	7.79	7.11	6.54	10.88
Sept. 15	13.98	15.81	17.50	15.69	9.22	6.79	8.11	7.68	7.47	6.53	10.88
Oct. 15	13.57	13.88	16.50	16.15	8.67	7.18	7.43	7.60	7.70	6.09	10.48
Nov. 15	11.64	13.36	15.92	15.31	8.74	6.35	7.00	7.33	7.05	5.86	9.86
Dec. 15	8.90	12.66	15.82	15.73	8.76	6.02	6.67	7.16	6.89	5.72	9.43

SWINE—Continued.

Table 272.—*Hogs: Percentage of the different breeds in the United States, by States.*

Estimates below are based upon the following inquiry of live-stock reporters: "Letting 100 represent the total number in your locality, what proportion of the total belongs to the breeds named? Grades and scrubs should be included in the breed in which the type predominates."

State and division.	Berkshire.	Cheshire.	Chester White.	Duroc Jersey.	Hampshire.	Yorkshire.	Poland China.	Tamworth.	Razorback.	Other.	Nondescript.
Maine	24.0	8.5	46.8	1.8	0.9	2.1	3.1	0.1	......	2.9	9.8
New Hampshire	23.7	1.9	46.3	2.2	.2	5.6	3.4	.1	......	3.6	13.0
Vermont	23.1	.9	54.7	3.2	.3	2.1	4.4	.4	......	2.5	8.4
Massachusetts	28.6	2.2	39.6	5.1	.3	5.1	3.6	.4	......	4.4	10.7
Rhode Island	......	......	......	......	......	......	......	......	......	......	......
Connecticut	......	......	......	......	......	......	......	......	......	......	......
New York	24.9	3.1	40.3	7.0	.5	3.9	6.1	.3	......	3.4	10.5
New Jersey	30.5	1.7	25.5	13.9	.3	1.1	14.3	.3	......	4.1	8.3
Pennsylvania	31.1	1.1	28.1	10.7	1.2	1.3	15.2	.3	......	2.9	8.1
Delaware	27.1	......	12.5	9.8	.7	1.1	21.8	.4	......	7.8	18.8
Maryland	25.4	1.7	10.6	14.5	1.4	1.0	21.9	.7	......	5.4	17.4
Virginia	26.2	.4	5.1	26.6	2.5	1.0	24.6	1.0	2.5	1.9	8.2
West Virginia	17.0	.7	14.8	15.6	.9	.2	37.5	.4	1.9	2.7	8.3
North Carolina	17.0	.1	4.2	32.4	3.4	.5	19.2	1.1	7.3	4.4	10.4
South Carolina	18.8	.1	4.3	29.3	2.4	......	13.1	1.8	12.0	2.4	15.8
Georgia	17.8	.1	1.4	22.4	14.1	......	11.5	.5	20.5	5.3	6.4
Florida	12.1	......	.7	38.5	5.0	.6	5.8	.8	27.8	2.1	6.6
Ohio	7.1	.4	15.0	37.0	2.9	.8	27.8	.6	......	3.4	5.0
Indiana	5.1	.2	12.7	33.4	4.2	.9	34.8	.3	......	3.9	4.5
Illinois	5.8	.4	14.5	33.6	4.5	.3	34.4	.8	......	2.2	3.5
Michigan	8.4	.2	24.0	29.4	.9	1.7	25.7	.2	......	4.6	4.9
Wisconsin	7.6	.1	17.6	27.7	.9	1.3	33.5	1.4	......	4.7	5.2
Minnesota	3.7	.3	14.8	40.1	.4	1.4	28.8	.1	......	2.7	7.7
Iowa	2.7	.3	15.4	40.1	5.6	.6	30.7	1.0	......	1.3	2.3
Missouri	6.0	.3	7.2	32.9	4.5	.4	40.8	.5	1.0	2.5	3.9
North Dakota	5.5	.5	15.4	39.0	1.1	4.6	24.5	.1	......	3.0	6.3
South Dakota	2.5	.1	10.9	50.4	4.8	.5	25.3	.4	......	2.6	2.5
Nebraska	2.2	.1	6.6	48.2	4.9	.4	33.4	.3	......	1.8	2.1
Kansas	5.5	.3	5.6	43.7	3.1	.1	34.3	.4	.1	2.6	4.3
Kentucky	11.2	.3	7.2	40.8	2.3	.4	24.0	.5	2.3	4.0	7.0
Tennessee	16.2	.8	5.1	34.9	1.8	.6	27.6	.3	4.8	2.9	5.0
Alabama	13.2	.2	2.4	32.2	7.1	......	19.8	.6	14.3	3.2	7.0
Mississippi	9.5	.3	2.2	33.3	3.6	......	26.2	.6	11.5	1.8	11.0
Louisiana	9.7	......	.6	28.0	1.2	.4	20.2	.7	26.7	.9	11.6
Texas	8.7	......	1.9	36.2	.9	.2	34.5	1.9	7.3	2.2	6.2
Oklahoma	4.3	......	2.5	44.1	1.5	......	35.9	.8	3.2	2.2	5.5
Arkansas	8.7	.2	2.9	29.6	2.9	.8	27.9	1.3	11.5	2.4	11.8
Montana	13.8	.2	10.3	28.7	1.4	.1	36.4	1.0	......	1.7	6.4
Wyoming	5.5	......	3.5	42.3	1.1	......	36.7	1.0	......	1.6	8.3
Colorado	12.4	.2	2.4	46.6	.6	.3	31.8	.6	......	1.6	3.5
New Mexico	10.6	.2	1.6	44.6	.4	......	37.6	......	......	......	5.0
Arizona	7.1	......	3.5	32.0	......	......	49.5	......	1.0	......	6.9
Utah	29.7	.4	16.6	23.3	......	......	14.4	2.0	......	7.5	6.1
Nevada	33.1	......	3.4	26.8	2.5	......	29.6	......	......	.9	3.7
Idaho	13.4	.2	7.1	34.6	.5	1.4	32.1	.5	......	1.4	8.8
Washington	14.2	.7	20.2	31.2	1.5	......	22.4	.3	......	2.9	6.6
Oregon	12.7	......	16.7	24.4	2.1	......	28.9	.1	.5	3.7	10.9
California	27.7	.3	2.6	26.5	4.1	.3	27.1	1.3	1.0	2.5	6.6
United States	9.2	.3	10.7	34.2	3.9	.6	27.9	.7	4.2	2.7	5.6
North Atlantic	28.3	2.1	35.0	8.4	.8	2.4	10.2	.3	.2	3.2	9.1
South Atlantic	18.2	.2	3.7	27.2	6.8	.4	15.3	.9	14.4	3.8	9.1
N. C. east Miss. River	6.4	.3	15.3	33.3	3.3	.8	32.1	.7	.2	3.4	4.2
N. C. west Miss. River	3.5	.3	11.7	40.9	4.4	.7	32.4	.6	.3	2.0	3.2
South Central	10.6	.2	3.1	34.4	2.8	.3	26.7	.9	10.3	2.5	8.2
Far western	19.1	.3	7.6	31.3	2.2	.3	28.8	.8	1.4	2.5	5.7

SWINE—Continued.

TABLE 273.—*Hogs (live): Wholesale price per 100 pounds, 1913–1920.*

[Compiled from commercial papers.]

Date.	Cincinnati. Packing, fair to good.			St. Louis. Mixed packers.			Chicago. Mixed and packers.			Kansas City.			Omaha.		
	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.	Low.	High.	Average.
1913.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.
January–June	7.45	10.00	8.64	7.20	9.50	8.44	6.95	9.60	8.31	6.95	9.25	.....	6.70	9.05	8.16
July–December	7.60	9.60	8.58	7.25	9.50	8.46	7.15	9.65	8.20	7.20	9.25	.....	7.34	9.15	7.96
1914.															
January–June	8.00	9.15	8.61	7.75	8.95	8.49	7.60	9.00	8.37	7.55	8.80	.....	7.35	8.73	8.20
July–December	6.40	9.90	8.32	6.80	9.85	8.31	6.50	10.20	8.06	6.65	9.75	.....	6.50	9.35	7.89
1915.															
January–June	6.50	8.00	7.35	6.00	7.97	7.25	6.15	7.95	7.01	6.35	7.90	7.07	6.00	7.95	6.93
July–December	6.25	8.70	7.41	6.15	8.75	7.36	5.80	8.95	7.07	6.00	8.65	7.19	4.00	8.95	6.79
1916.															
January–June	6.40	10.25	8.84	6.00	10.25	9.01	6.45	10.30	8.97	6.25	10.05	8.84	6.00	9.90	8.65
July–December	7.35	11.40	10.06	8.90	11.50	10.17	8.50	11.60	9.94	7.75	11.00	9.71	8.50	11.10	9.74
1917.															
January–June	10.60	16.25	14.17	9.90	16.55	14.23	9.75	16.60	14.10	9.80	16.45	13.93	9.40	16.20	13.74
July–December	15.40	19.15	17.00	15.00	19.80	17.32	14.00	20.00	16.78	14.50	19.65	16.78	14.00	19.60	16.85
1918.															
January–June	16.25	18.25	17.22	14.00	18.20	16.64	15.00	18.25	16.99	15.00	17.75	16.61	15.00	17.50	16.51
July–December	14.50	20.25	17.90	14.00	20.75	18.39	14.00	20.40	17.79	14.50	20.65	18.12	15.25	20.40	17.87
1919.															
January–June	14.00	21.25	18.26	12.25	21.85	19.14	15.75	21.55	19.13	16.25	21.50	18.78	16.00	21.10	18.88
July–December	11.50	23.25	17.05	12.25	23.55	18.89	11.50	23.50	16.99	11.00	23.20	16.56	11.75	22.85	14.33
1920.															
January	14.00	16.75	15.39	14.00	16.35	15.15	13.60	16.00	14.61	12.50	16.00	14.57	13.80	15.40	14.62
February	14.50	16.00	15.28	13.00	15.85	14.59	12.25	15.60	14.00	12.50	15.40	13.86	13.25	15.00	14.00
March	14.25	16.50	15.41	13.75	16.40	15.08	13.60	16.80	14.82	12.00	16.10	14.35	12.50	15.25	14.27
April	14.00	18.00	16.15	12.50	17.00	15.34	12.75	16.75	14.89	12.00	16.10	13.93	11.75	15.25	14.07
May	13.50	16.25	14.50	13.25	15.65	14.60	12.40	15.65	14.09	13.00	15.00	13.88	13.00	14.75	13.80
June	14.50	16.50	15.19	13.75	16.55	15.16	12.50	16.60	14.32	13.00	15.90	14.34	13.00	15.50	14.11
January–June	13.50	18.00	15.32	12.50	17.00	14.99	12.25	16.80	14.46	12.00	16.10	14.16	11.75	15.50	14.14
July	15.00	16.25	16.28	14.75	16.65	15.93	12.50	16.65	14.74	14.50	16.15	15.30	13.25	15.50	14.58
August	14.50	16.50	15.66	14.25	16.75	15.43	13.25	16.40	14.77	13.75	16.00	14.80	13.25	14.85	14.20
September	15.75	18.00	16.80	14.00	18.25	16.50	13.75	18.25	15.93	14.00	17.80	16.01	14.20	17.25	15.13
October	13.00	16.75	15.44	12.00	16.40	14.64	11.50	16.10	14.20	11.50	15.00	13.88	12.25	15.00	13.67
November	11.00	14.75	12.66	8.50	14.75	12.16	9.25	14.50	11.93	8.00	15.10	11.64	9.25	13.40	11.66
December	9.50	11.00	10.28	8.90	10.80	9.85	8.40	10.55	9.50	7.25	10.15	8.86	8.00	10.20	9.19
July–December	9.50	18.00	14.52	8.50	18.25	14.08	8.40	18.25	13.51	7.25	17.80	13.42	8.00	17.25	13.07

LIVE STOCK VALUES.

TABLE 274.—*Aggregate live stock value comparisons, 1920, 1921, and average 1915–1919.*

[Farm values Jan. 1, in millions of dollars, i. e., 000,000 omitted; States arranged according to 1921 rank in value of all animals.]

State.	Cattle, hogs, and sheep.			Horses and mules.			Total (cattle, hogs, sheep, horses, and mules).			Rank in aggregate value.	
	1921	1920	Av., 1915–1919.	1921	1920	Av., 1915–1919.	1921	1920	Av., 1915–1919.	1921	1920
Iowa	322	500	404	115	133	170	437	633	574	1	1
Texas	261	347	274	174	225	175	435	572	449	2	2
Illinois	179	295	221	123	149	168	302	444	389	3	3
Missouri	160	247	194	108	132	134	268	379	328	4	4
Wisconsin	195	299	199	70	74	85	265	373	284	5	5
Ohio	178	259	185	86	92	108	264	351	293	6	6
Nebraska	149	219	202	96	122	139	245	341	341	7	7
Kansas	167	251	233	76	86	108	243	337	341	8	8
Minnesota	162	249	166	77	86	99	239	335	265	9	9
New York	154	233	161	70	80	85	224	313	246	10	10
Indiana	135	204	148	82	93	101	217	297	249	11	11
California	162	190	140	43	45	54	205	235	194	12	14
Pennsylvania	128	172	117	71	75	81	199	247	198	13	12
Michigan	117	175	118	58	61	82	175	236	200	14	13
South Dakota	93	155	125	49	60	72	142	215	197	15	15
Georgia	73	105	63	68	97	72	141	202	135	16	16
Oklahoma	69	108	101	68	94	93	137	202	194	17	17
Kentucky	65	93	71	62	75	68	127	168	139	18	18
Mississippi	54	83	53	59	78	59	113	161	112	19	19
North Carolina	54	72	42	57	73	57	111	145	99	20	23
Tennessee	49	82	55	60	78	71	109	160	126	21	20
Virginia	63	86	55	42	48	46	105	134	101	22	25
Colorado	77	116	98	28	36	37	105	152	135	23	21
Alabama	50	77	52	50	74	54	100	151	106	24	22
North Dakota	50	74	62	50	68	86	100	142	148	25	24
Arkansas	41	63	48	54	69	54	95	132	102	26	26
Montana	67	94	96	26	32	43	93	126	139	27	27
Louisiana	51	68	43	41	50	37	92	118	80	28	28
New Mexico	73	95	74	15	18	16	88	113	90	29	30
Oregon	61	85	61	23	25	29	84	110	90	30	31
South Carolina	33	51	26	51	64	44	84	115	70	31	29
Arizona	55	61	54	12	10	10	67	71	64	32	37
Wyoming	55	82	90	9	11	16	64	93	106	33	32
Idaho	45	69	60	18	21	24	63	90	84	34	33
West Virginia	42	54	40	20	21	22	62	75	62	35	35
Florida	47	58	34	14	16	13	61	74	47	36	36
Washington	35	48	36	25	29	32	60	77	68	37	34
Utah	38	52	44	11	12	13	49	64	57	38	38
Maryland	27	34	23	18	20	21	45	54	44	39	39
Nevada	34	44	37	4	5	6	38	49	43	40	40
New Jersey	24	29	19	13	14	14	37	43	33	41	42
Vermont	25	35	25	10	12	12	35	47	37	42	41
Maine	17	23	17	15	16	17	32	39	34	43	43
Massachusetts	21	25	18	7	8	9	28	33	27	44	44
Connecticut	16	19	13	6	7	7	22	26	20	45	45
New Hampshire	11	14	11	5	6	6	16	20	17	46	46
Delaware	6	6	4	3	3	4	9	9	8	47	47
Rhode Island	3	3	2	1	1	1	4	4	3	48	48
United States	3,993	5,803	4,414	2,243	2,704	2,754	6,636	8,507	7,168	......	......

LIVE STOCK PRICES.

TABLE 275.—*Prices of live stock by ages or classes, United States, 1915–1921.*

Cattle.	1921	1920	1919	1918	1917	1916	1915
Horses:							
Under 1 year old	$33.61	$39.07	$42.62	$45.20	$45.17	$44.30	$45.36
1 and under 2 years	52.33	61.40	65.94	70.21	70.21	69.02	70.62
2 years and over	90.90	104.06	108.17	114.30	112.64	111.28	113.10
Mules:							
Under 1 year old	47.42	60.53	59.14	57.61	53.98	51.47	51.80
1 and under 2 years	72.55	91.92	89.14	86.32	80.28	76.69	76.46
2 years and over	126.22	160.51	147.65	139.88	128.17	123.59	121.46
Other cattle (than milk):							
Under 1 year	17.47	24.45	24.97	23.44	20.71	19.08	19.06
1 and under 2 years	29.23	41.07	41.74	38.63	33.93	31.48	31.21
2 years and over	43.65	59.19	60.41	55.62	48.63	45.81	45.92
Sheep:							
Under 1 year	5.38	8.11	8.82	9.06	5.63	4.13	3.62
Ewes 1 year and over	6.39	11.09	12.44	12.70	7.48	5.35	4.59
Wethers 1 year and over	5.96	9.67	11.02	11.26	6.78	5.02	4.48
Rams	14.87	21.52	21.90	20.84	13.62	10.32	9.01

LIVE STOCK MARKETINGS.

TABLE 276.—*Yearly marketings of live stock at principal markets, 1900–1920.*

The combined receipts and shipments of cattle, hogs, and sheep at Chicago, Kansas City, Omaha, St. Louis, Sioux City, St. Joseph, and St. Paul yearly since 1900 were as follows:

Year.	Cattle.		Hogs.		Sheep.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1900	7,179,344	3,793,308	18,573,177	5,336,826	7,061,466	2,500,686
1901	7,708,839	3,888,460	20,339,864	5,772,717	7,798,359	2,712,866
1902	8,375,408	4,292,705	17,289,427	4,130,675	9,177,050	3,561,060
1903	8,878,789	4,490,748	16,780,250	4,233,572	9,680,692	3,983,310
1904	8,690,699	4,552,554	17,778,827	5,254,545	9,604,812	4,203,834
1905	9,202,083	4,964,753	18,988,933	5,614,306	10,572,259	4,725,872
1906	9,373,825	5,026,689	19,223,792	5,440,333	10,864,437	5,046,366
1907	9,590,710	5,360,790	19,544,617	5,993,069	9,857,877	4,549,000
1908	8,827,360	4,936,731	22,863,701	7,288,403	9,833,640	4,489,295
1909	9,189,312	5,181,446	18,420,012	6,381,667	10,284,858	4,172,388
1910	9,116,687	5,122,984	14,853,472	4,628,760	12,366,375	6,013,215
1911	8,629,109	4,805,766	19,926,547	6,418,246	13,521,492	5,891,034
1912	8,061,494	4,318,648	19,771,825	6,096,906	13,733,980	5,369,402
1913	7,904,552	4,596.085	19,924,331	6,414,815	14,037,830	6,046,260
1914	7,182,239	3,933,663	18,272,091	5,816,069	13,272,491	5,331,449
1915	7,963,591	3,944,152	21,031,405	6,823,983	11,160,246	4,370,504
1916	9,319,851	4,713,700	25,345,802	8,264,752	11,639,022	4,640,615
1917	11,241,038	5,676,015	20,945,301	7,151,995	10,017,353	4,534,489
1918	12,936,068	5,388,838	25,461,514	7,111,935	12,064,416	5,749,835
1919	12,151,920	5,316,761	25,280,245	5,941,663	14,307,503	5,714,471
1920	9,969,911	4,581,771	22,433,301	6,268,630	11,017,479	4,157,730

Figures for 1900–1909, inclusive, were taken from the Monthly Summary of Commerce and Finance of the United States; 1910 and subsequently from official reports of the stockyards in the cities mentioned,

The receipts of calves (not included in "Cattle") at the stockyards of Chicago, Kansas City, St. Joseph. St. Paul, and Sioux City, combined, were about 1,645,958 in 1920, 1,589,491 in 1919, 1,361,787 in 1918, 1,180,063 in 1917, 918,778 in 1916, 726,145 in 1915, 664,000 in 1914, 741,000 in 1913, about 910,000 in 1912, 975,000 in 1911, 981,000 in 1910, and 869,000 in 1909.

TABLE 277.—*Receipts and local slaughter at public stockyards in United States, 1916–1920.*

[Bureau of Markets.]

Year.	Cattle and calves.		Hogs.		Sheep.	
	Receipts.	Local slaughter.	Receipts.	Local slaughter.	Receipts.	Local slaughter.
1916	17,675,537	10,457,889	43,265,224	31,175,312	20,691,665	11,498,477
1917	23,065,721	13,275,168	38,041,870	25,440,363	20,216,287	9,141,872
1918	25,294,557	14,874,199	44,862,634	30,440,480	22,485,038	10,266,327
1919	24,623,805	13,633,087	44,467,394	30,015,779	27,256,345	12,646,272
1920	22,196,429	12,194,254	42,120,735	26,760,979	23,537,534	10,981,442

THE FEDERAL MEAT INSPECTION.

Some of the principal facts connected with the Federal meat inspection as administered by the Bureau of Animal Industry are shown in the following tables. The figures cover the annual totals beginning with the fiscal year 1907, which was the first year of operations under the meat-inspection law now in force. The data given comprise the number of establishments at which inspection is conducted; the number of animals of each species inspected at slaughter; the number of each species condemned, both wholly and in part, and the percentage condemned of each species and of all animals; the quantity of meat products prepared or processed under Federal supervision, and the quantity and percentage of the latter condemned.

Further details of the Federal meat inspection are published each year in the annual report of the Chief of the Bureau of Animal Industry.

TABLE 278.—*Number of establishments inspected and total number of animals slaughtered under Federal inspection annually, 1907 to 1920.*

Year ending June 30—	Establishments.	Cattle.	Calves.	Swine.	Sheep.	Goats.	All animals.
1907	708	7,621,717	1,763,574	31,815,900	9,681,876	52,149	50,935,216
1908	787	7,116,275	1,995,487	35,113,077	9,702,545	45,953	53,973,337
1909	876	7,325,337	2,046,711	35,427,931	10,802,903	69,193	55,672,075
1910	919	7,962,189	2,295,099	27,656,021	11,149,937	115,811	49,179,057
1911	936	7,781,030	2,219,908	29,916,363	13,005,502	54,145	52,976,948
1912	940	7,532,005	2,242,929	34,966,378	14,208,724	63,983	59,014,019
1913	910	7,155,816	2,098,484	32,287,538	14,724,465	56,556	56,322,859
1914	893	6,724,117	1,814,904	33,289,705	14,958,834	121,827	56,909,387
1915	896	6,964,402	1,735,902	36,247,958	12,909,089	165,533	58,022,884
1916	875	7,404,288	2,048,022	40,482,799	11,985,926	180,356	62,101,391
1917	833	9,299,489	2,679,745	40,210,847	11,343,418	174,649	63,708,148
1918	884	10,938,287	3,323,077	35,449,247	8,769,498	149,503	58,629,612
1919	895	11,241,991	3,674,227	44,398,389	11,268,370	125,660	70,708,637
1920	897	9,709,819	4,227,558	38,981,914	12,334,827	77,270	[1] 65,332,477

[1] Includes 1,089 horses slaughtered.

TABLE 279.—*Condemnations of animals at slaughter, 1907–1920.*

Year ended June 30—	Cattle.			Calves.			Swine.		
	Whole.	Part.	Per cent.[1]	Whole.	Part.	Per cent.[1]	Whole.	Part.	Per cent.[1]
1907	27,933	93,174	1.58	6,414	245	0.38	105,879	436,161	1.70
1908	33,216	67,482	1.41	5,854	396	.31	127,933	636,589	2.18
1909	35,103	99,739	1.84	8,213	409	.42	86,912	799,300	2.50
1910	42,426	122,167	2.07	7,524	500	.35	52,439	726,829	2.82
1911	39,402	123,969	2.10	7,654	781	.38	59,477	877,528	3.13
1912	50,363	134,783	2.46	8,927	1,212	.45	129,002	323,992	1.30
1913	50,775	130,139	2.53	9,216	1,377	.50	173,937	373,993	1.70
1914	48,356	138,085	2.77	6,696	1,234	.44	204,942	422,275	1.88
1915	52,496	178,409	3.32	5,941	1,750	.44	213,905	464,217	1.87
1916	57,579	188,915	3.33	6,681	1,988	.42	195,107	546,290	1.83
1917	78,706	249,637	3.53	10,112	2,927	.49	158,480	528,288	1.71
1918	68,156	178,940	2.26	8,109	2,308	.31	113,079	347,006	1.30
1919	59,549	166,791	2.01	9,202	2,479	.32	128,805	433,433	1.27
1920	58,602	194,058	2.60	13,820	2,866	.39	133,476	550,580	1.75
Average;									
1907–1910	34,670	95,640	1.74	7,001	388	.36	93,291	649,720	2.29
1911–1915	48,278	141,077	2.62	7,687	1,271	.44	156,253	492,401	1.95
1916–1920	64,518	195,668	2.63	9,585	2,514	.38	145,789	481,119	1.57

[1] Includes both whole and parts. It should be understood that the parts here recorded are primal parts; a much larger number of less important parts, especially in swine, are condemned in addition.

TABLE 279.—*Condemnations of animals at slaughter, 1907–1920*—Continued.

Year ended June 30—	Sheep.			Goats.			All animals.		
	Whole.	Part.	Per cent.[1]	Whole.	Part.	Per cent.[1]	Whole.	Part.	Per cent.[1]
1907	9,524	296	0.10	42		0.08	149,792	529,876	1.33
1908	8,090	198	.09	33	1	.07	175,126	704,666	1.63
1909	10,747	179	.10	82	1	.12	141,057	899,628	1.87
1910	11,127	24,714	.32	226	1	.19	113,742	874,211	2.01
1911	10,789	7,394	.14	61		.11	117,383	1,009,672	2.13
1912	15,402	3,871	.13	84	1	.13	203,778	463,859	1.13
1913	16,657	939	.12	76	1	.14	250,661	506,449	1.34
1914	20,563	1,564	.15	746	8	.62	281,303	563,166	1.48
1915	17,611	298	.14	653	14	.40	290,606	644,688	1.61
1916	15,057	1,007	.13	663	161	.46	275,087	738,361	1.63
1917	16,749	437	.15	1,349	42	.80	265,396	781,331	1.64
1918	12,564	227	.15	419	1	.28	202,327	528,482	1.25
1919	14,371	330	.13	318	17	.27	212,245	603,050	1.15
1920	20,028	627	.17	135	1	.18	[2] 226,125	[2] 748,136	1.49
Average:									
1907–1910	9,872	6,347	.16	96	1	.14	144,929	752,095	1.71
1911–1915	16,204	2,813	.14	324	6	.36	228,746	637,567	1.53
1916–1920	15,754	526	.15	577	44	.44	236,236	679,872	1.43

[1] Includes both whole and parts. It should be understood that the parts here recorded are primal parts; a much larger number of less important parts, especially in swine, are condemned in addition.
[2] Includes condemnation of horses; Whole, 64: part, 4.

TABLE 280.—*Quantity of meat and meat food products prepared, and quantity and percentage condemned, under Federal supervision annually, 1907 to 1920.*

Year ended June 30—	Prepared or processed.	Condemned.	Percentage condemned.	Year ended June 30—	Prepared or processed.	Condemned.	Percentage condemned.
	Pounds.	*Pounds.*	*Per cent.*		*Pounds.*	*Pounds.*	*Per cent.*
1907	4,464,213,208	14,874,587	0.33	1917	7,663,633,957	19,857,270	0.26
1908	5,958,298,364	43,344,206	.73	1918	7,905,184,924	17,543,184	.22
1909	6,791,437,032	24,679,754	.36	1919	9,169,042,049	30,323,320	.33
1910	6,223,964,593	19,031,808	.31	1920	7,755,158,142	18,201,648	.23
1911	6,934,233,214	21,073,577	.31				
1912	7,279,558,956	18,096,587	.25	Average:			
1913	7,094,809,809	18,851,930	.27	1907–1910.	5,859,478,299	25,482,589	.43
1914	7,033,295,975	19,135,469	.27	1911–1915.	7,174,993,591	19,187,537	.27
1915	7,533,070,002	18,780,122	.25	1916–1920.	7,993,452,253	20,764,558	.26
1916	7,474,242,192	17,897,367	.24				

The principal items in Table 280, in the order of magnitude, are: Cured pork, lard, sausage, canned beef, lard substitutes, and oleo products. The list includes a large number of less important items.
It should be understood that the above products are entirely separate and additional to the carcass inspection at time of slaughter. They are, in fact, reinspections of such portions of the carcass as have subsequently undergone some process of manufacture.

TABLE 281.—*Quantity of meat and meat food products imported, and quantity and percentage condemned or refused entry, 1914 to 1920.*

Year ended June 30—	Total imported.	Condemned.	Refused entry.	Percentage condemned or refused.
	Pounds.	*Pounds.*	*Pounds.*	*Per cent.*
1914 (9 months)	197,389,348	551,859		0.28
1915	245,023,437	2,020,291	70,454	.85
1916	110,514,476	298,276	113,907	.37
1917	29,138,996	382,160	14,611	1.36
1918	59,025,481	989,916	414,452	2.38
1919	179,911,142	340,358	501,802	.47
1920	77,781,329	229,338	392,166	.80

IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCTS.[1]

[Compiled in the Bureau of Crop Estimates from reports of the foreign commerce and navigation of the United States, United States Department of Commerce.]

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919.*

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ANIMAL MATTER.						
Animals, live:						
Cattle [2] ....number..	347,510	$18,245,973	352,601	$25,518,585	642,395	$53,296,078
Horses—						
For breeding purposes,[2] number..............	2,376	951,278	717	362,962	942	306,464
Other........number..	7,626	679,391	3,152	417,165	4,052	496,289
Total horses...do....	10,002	1,630,669	3,869	780,127	4,994	802,753
Sheep [2]............do....	202,861	2,014,169	150,203	1,653,717	224,774	2,473,386
Swine.............do....	16,236	396,961	7,467	185,617	20,657	758,259
All other, including fowls.	....	772,721	....	493,115	....	706,885
Total live animals....	....	23,060,493	....	28,631,161	....	58,037,361
Beeswax.........pounds..	2,858,190	994,169	1,558,048	584,194	2,383,901	896,327
Dairy products:						
Butter.............do....	1,307,750	444,332	1,655,467	580,324	9,519,368	4,860,182
Cheese.............do....	6,332,562	2,566,489	7,562,044	3,059,078	11,332,204	4,073,357
Milk and cream..........	....	3,060,117	....	[3] 1,646,316	....	....
Fresh.........gallons..	....	....	[4] 1,349,628	[4] 726,816	3,684,817	1,850,203
Condensed....pounds..	....	....	[4] 10,904,998	[4] 927,668	16,509,239	2,080,070
Total dairy products.	....	6,070,938	....	6,940,202	....	12,863,812
Eggs...............dozen..	1,179,047	314,419	1,244,826	363,227	1,247,355	394,629
Egg albumen.....pounds..	....	....	1,386,947	503,154	7,978,239	6,061,114
Egg yolks or frozen eggs, pounds............	16,268,379	3,559,504	6,752,453	2,459,552	24,890,621	8,469,987
Feathers and downs, crude:						
Ostrich.........pounds..	(5)	415,883	(5)	675,791	309,069	2,698,146
Other.............do....	(5)	1,149,282	(5)	844,408	1,599,805	852,810
Fibers, animal:						
Silk—						
Cocoons.........do....	103,017	99,871	220,250	297,296	852,474	486,636
Raw, or as reeled from the cocoons.pounds..	36,502,831	184,283,183	32,865,543	180,209,537	44,816,918	329,338,872
Waste...........do....	6,822,409	5,369,856	15,635,266	13,691,765	9,852,980	12,061,268
Total silk......do....	43,428,257	189,752,910	48,720,969	194,198,598	55,522,372	341,886,776
Wool and hair of the camel, goat, alpaca, and like animals—						
Class 1, clothing, pounds...............	320,801,426	133,353,679	373,910,875	216,789,966	334,099,538	171,288,562
Class 2, combing, pounds...............	22,333,306	11,420,305	4,223,223	2,646,651	7,734,081	4,583,522
Class 3, carpets, pounds...............	73,002,602	24,892,904	69,291,858	29,256,094	96,948,324	36,898,361
Hair of the Angora goat, alpaca, etc., pounds............	4,857,213	1,890,564	6,301,416	3,079,905	7,110,891	3,994,056
Total, wool.pounds..	420,994,547	171,557,452	453,727,372	251,772,616	445,892,834	216,764,501
Total animal fibers, pounds............	464,422,804	361,310,362	502,448,341	445,971,214	501,415,206	558,651,277

[1] Forest products come within the scope of the Department of Agriculture and are therefore included in alphabetical order in these tables.
[2] Including all imported free of duty.
[3] Jan. 1 to June 30.
[4] July 1 to Dec. 31.
[5] Not stated.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ANIMAL MATTER—contd.						
Gelatin............pounds..	826,115	$304,249	82,766	$32,353	449,336	$241,835
Glue and glue size...do....	6,775,192	1,048,328	732,324	172,642	886,042	208,882
Honey............gallons..	533,229	484,450	406,719	657,296	454,215	565,525
Packing-house products:						
Blood, dried....pounds..	(²)	512,721	(²)	638,670	11,004,248	379,754
Bones, hoofs, and horns, pounds..................	(²)	1,602,213	(²)	685,155	50,387,631	840,562
Bristles—						
Crude, unsorted, ... pounds..	65,137	79,357	31,987	65,061	77,469	103,796
Sorted, bunched, or prepared..pounds..	4,051,755	4,499,652	4,119,070	5,639,755	3,081,379	5,931,579
Total bristles..do....	4,116,892	4,579,009	4,151,057	5,704,816	3,158,848	6,035,375
Grease.............do....	(²)	1,614,196	(²)	3,558,509	33,871,038	3,304,364
Hair—						
Horse............do....	5,798,474	1,907,371	2,879,654	997,704	4,014,689	1,643,512
Other animal....do....	5,728,594	804,852	3,475,533	316,852	4,545,195	542,099
Hide cuttings and other glue stock.....pounds..	34,499,825	1,560,673	9,381,629	454,838	13,780,637	978,514
Hides and skins, other than furs—						
Buffalo hides, dry, pounds...............	24,801,270	6,199,718	5,818,589	1,547,268	15,619,738	3,463,457
Cabretta......pounds..	....	....	....	....	93,985	86,382
Calfskins—						
Dry............do....	20,473,688	7,672,282	5,489,321	2,236,592	42,325,180	20,914,320
Green or pickled, pounds.............	9,111,917	3,839,273	2,093,402	717,367	22,230,341	12,738,819
Cattle hides—						
Dry.........pounds..	141,665,026	46,038,100	34,835,629	10,157,056	96,190,263	34,366,505
Green or pickled, pounds.............	229,019,800	56,318,952	186,215,441	41,872,585	311,092,008	91,223,542
Horse and ass skins—						
Dry.........pounds..	9,047,853	2,982,567	872,842	183,435	12,077,113	3,612,468
Green or pickled, pounds.............	13,414,099	2,320,149	4,125,014	536,250	15,975,796	3,633,399
Kangaroo.....pounds..	603,571	548,088	679,448	733,133	1,383,939	1,362,991
Sheepskins [1]—						
Dry............do....	50,357,425	18,393,426	21,530,047	7,532,018	43,560,327	21,288,083
Green or pickled, pounds.............	33,624,932	11,041,024	30,934,304	9,870,034	41,471,492	15,232,431
Goat skins—						
Dry.........pounds..	76,461,567	48,013,139	53,305,631	28,643,092	111,134,251	85,827,672
Green or pickled, pounds.............	12,441,174	3,398,000	9,057,918	1,847,105	22,522,563	9,729,448
Other.........pounds..	10,043,361	2,965,722	6,933,313	2,167,768	9,159,039	3,030,501
Total hides and skins, pounds.............	631,065,683	209,730,440	361,890,899	108,043,703	744,836,035	306,510,023
Meat—						
Cured—						
Bacon and hams, pounds.............	240,404	69,864	1,863,124	544,296	2,646,235	787,730
Meat prepared or preserved..pounds..	(²)	2,228,135	(²)	38,201,131	21,189,854	5,837,546
Sausage, bologna, pounds.............	13,070	4,958	5,417	2,797	71,732	43,340
Fresh—						
Beef and veal, pounds.............	22,072,147	3,088,759	23,339,081	4,159,186	38,461,758	6,408,061
Mutton and lamb, pounds.............	5,623,903	685,401	607,896	134,290	8,200,182	1,547,338
Pork........pounds..	2,580,340	553,812	1,721,979	376,604	2,779,361	601,051
Other, including meat extracts..pounds..	(²)	10,786,682	(²)	7,337,842	8,596,049	1,837,750
Total meat...........	(²)	17,417,611	(²)	50,756,146	81,954,171	17,062,836

[1] Except sheepskins with the wool on. [2] Not stated.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ANIMAL MATTER—contd.						
Packing-house products—Continued.						
Meat—Continued.						
Oleo stearin...pounds..	5,555,448	$936,561	1,556,781	$250,122	2,358,446	$475,156
Rennets..........do....	(1)	21,884	(1)	78,590	102,686	146,542
Sausage casings..do....	(1)	4,050,825	(1)	3,508,434	11,234,028	5,629,412
Tallow...........do....	....	....	2 5,395,405	2 702,075	12,096,189	1,812,903
Total packing-house products..pounds..	(1)	244,738,356	(1)	175,695,614	973,343,841	345,361,052
Total animal matter..	....	643,450,433	....	663,530,808	....	995,302,757
VEGETABLE MATTER.						
Argols or wine lees.pounds..	28,467,432	4,714,498	27,687,478	4,824,504	25,735,599	4,286,972
Breadstuffs. (*See* Grain and grain products.)						
Broom corn.....long tons..	877	149,892	1,766	364,936	10	1,610
Cocoa and chocolate:						
Cocoa—						
Crude, leaves and shells of...........pounds..	390,047,655	41,415,354	359,959,761	37,955,200	391,397,309	57,999,464
Cocoa and chocolate, prepared..pounds..	790,650	258,849	55,598	17,169	967,203	342,420
Total cocoa and chocolate......pounds..	390,838,305	41,674,203	360,015,359	37,972,369	392,364,512	58,341,884
Coffee...............do....	1,286,524,074	122,607,254	1,052,201,501	99,423,362	1,333,564,067	261,270,106
Coffee substitutes:						
Chicory root—						
Roasted, ground, or otherwise prepared, pounds...............	327,243	35,746	....	....	56	28
Fibers, vegetable:						
Cotton..........pounds..	138,615,455	41,780,796	112,684,092	41,624,242	175,358,368	71,886,290
Flax—						
Hackled, known as "dressed line," long tons...........	7,331	5,276,777	7,856	7,361,598	2,129	2,929,062
All other....long tons..					2,291	1,067,528
Hemp.............do....	9,745	2,829,518	3,875	1,982,494	1,698	953,576
Istle, or Tampico fiber, long tons...............	29,156	2,539,146	31,744	3,648,815	20,840	2,523,330
Jute and jute butts, long tons...............	87,682	8,315,121	71,414	6,462,534	62,332	8,384,479
Kapoc........long tons..	7,565	1,855,673	9,576	2,820,474	10,972	3,673,285
Manila.............do....	92,112	27,321,018	78,783	29,332,928	68,536	19,255,282
New Zealand flax..do....	9,019	2,286,922	13,912	4,867,576	6,720	1,640,755
Sisal grass.........do....	143,871	43,053,717	151,876	54,937,104	144,542	39,553,701
Other..............do....	13,330	2,305,135	13,593	2,973,144	7,219	1,797,000
Total vegetable fibers.	....	137,563,823	....	156,010,909	....	153,664,288
Forest products:						
Cinchona bark..pounds..	2,057,327	574,160	3,507,974	792,078	5,981,293	1,075,74
Cork wood or cork bark, pounds...............	(1)	3,915,931	(1)	3 1,898,193	28,286,942	1,802,506
Dyewoods and extracts of—						
Dyewoods—						
Logwood..long tons..	61,735	1,519,878	29,841	668,141	29,022	549,885
Other..........do...	14,335	364,322	31,153	796,297	1,618	38,377
Total dyewoods.do...	76,070	1,884,200	60,994	1,464,438	30,640	588,262
Extracts and decoctions of.........pounds..	2,875,299	170,788	9,574,432	459,311	7,285,737	477,976
Total dyewoods and extracts of.........	....	2,054,988	....	1,923,749	....	1,066,238

1 Not stated. 2 July 1 to Dec. 31. 3 Includes "Waste, refuse, etc.," prior to July 1, 1918.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	1917 Quantity.	1917 Value.	1918 Quantity.	1918 Value.	1919 Quantity.	1919 Value.
VEGETABLE MATTER—con.						
Forest products—Contd.						
Gums—						
Arabic or Senegal, pounds			[1] 4,460,812	[1] $816,019	5,943,021	$819,452
Camphor—						
Crude.......pounds..	5,512,807	$1,849,674	3,474,282	1,547,180	2,693,822	2,505,566
Refined.........do....	3,108,240	1,664,105	947,144	769,882	2,125,210	3,829,817
Chicle............do....	6,117,922	3,073,484	7,251,022	3,917,104	9,445,538	6,216,978
Copal, kauri, and damar......pounds..	39,891,803	3,447,916	33,664,048	3,249,783	20,326,193	2,082,976
Gambier, or terra japonica....pounds..	11,321,569	1,145,031	8,764,020	952,323	4,744,651	432,499
India rubber, gutta-percha, etc.—						
Balata.......pounds..	3,193,387	1,607,343	1,547,338	836,383	1,628,134	937,038
Guayule gum..do....	4,852,531	1,487,978	1,376,085	413,484	3,204,224	760,690
Gutta joolatong or East Indian gum, pounds	24,774,867	1,144,948	9,932,476	683,551	18,662,702	2,213,964
Gutta-percha, pounds	1,476,426	289,802	1,207,986	225,922	6,495,818	1,068,698
India rubber, pounds	405,638,278	233,220,904	325,959,308	146,378,313	535,940,421	215,820,113
Total india rubber, etc.pounds..	439,935,489	237,750,975	340,023,193	148,537,653	565,931,299	220,800,503
Shellac...........do....	27,460,757	9,040,543	18,663,717	9,029,139	24,426,403	11,869,246
Other.............do....	(2)	2,234,229	(2)	1,903,349	11,291,131	3,387,096
Total gums....do....	(2)	260,205,957	(2)	170,722,432	646,927,268	251,944,196
Ivory, vegetable...do....	47,380,217	1,227,582	41,142,099	1,323,494	31,779,090	1,172,080
Tanning materials—						
Mangrove bark, long tons	4,203	107,844	2,363	96,867	2,523	87,869
Quebracho, extracts of...........pounds..	108,993,077	7,192,666	131,109,739	5,698,618	144,496,648	6,902,947
Quebracho wood, long tons	68,592	1,206,018	22,802	357,190	3,962	53,679
Sumac, ground, pounds	12,906,647	419,692	13,309,948	424,798	14,724,531	558,477
Other		623,023		161,447		1,556,273
Total tanning materials		9,549,243		6,738,920		9,159,245
Wood, not elsewhere specified—						
Brier root or brierwood and ivory or laurel root		423,592		831,371		1,287,831
Chair cane or reed		179,759		254,917		235,550
Cabinet woods, unsawed—						
Cedar.........M feet..	14,067	892,248	9,109	677,169	8,583	591,809
Mahogany.....do....	47,700	3,353,388	44,098	3,848,388	42,678	3,973,072
Other..........do....	(2)	679,660	(2)	713,186	7,599	705,722
Total cabinet woods....M feet..		4,925,296		5,238,743	58,860	5,270,603
Logs and round timber..........M feet..	103,154	1,030,368	33,659	566,837	93,356	1,690,672

[1] July 1 to Dec. 31. [2] Not stated.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Forest products—Contd.						
Wood, not elsewhere specified—Contd.						
Lumber—						
Boards, deals, planks, and other sawed lumber.....M feet..	1,203,600	$27,912,150	1,209,162	$34,314,720	1,149,320	$37,260,847
Laths..........do....	605,054	1,906,482	282,302	966,448	802,651	3,037,000
Shingles.......do....	1,936,809	5,160,482	1,797,612	5,626,932	1,987,480	8,720,032
Other...............	....	715,370	....	1,072,306	....	1,389,018
Total lumber.......	....	35,694,484	....	41,980,406	....	50,406,897
Pulp wood—						
Peeled........cords..	673,235	5,423,566	964,804	9,295,009	698,785	6,778,550
Rossed........do....	152,618	1,637,551	128,579	1,548,280	107,094	1,365,144
Rough.........do....	206,081	1,502,341	276,644	2,519,277	241,420	2,315,059
Rattan and reeds.......	....	1,557,352	....	1,308,465	....	872,374
Timber, ship and other.	....	(1)	....	256,976	....	297,205
All other...............	....	911,850	....	928,187	....	667,153
Total wood, n. e. s....	....	53,286,159	....	64,728,468	....	71,187,038
Wood pulp—						
Chemical—						
Bleached—						
Sulphate.long tons.	1,451	195,014	3,356	299,790	4,594	394,76
Sulphite.....do....	36,640	4,508,368	14,962	1,512,742	38,174	4,472,593
Unbleached—						
Sulphate.....do....	96,369	9,993,170	106,037	7,971,067	130,278	9,084,537
Sulphite.....do....	221,583	19,291,410	226,298	16,973,540	214,243	17,979,170
Mechanical......do....	249,172	7,991,368	165,605	4,720,036	180,583	5,117,316
Total wood pulp ....long tons..	605,215	41,979,330	516,258	31,477,175	567,872	37,048,381
Total forest products.	....	372,793,350	....	279,604,509	....	374,455,432
Fruits:						
Fresh or dried—						
Bananas.....bunches..	35,279,686	13,961,158	32,249,028	15,438,491	36,993,095	15,934,590
Currants.......pounds..	793,761	112,530	5,091,328	557,508	14,852,466	2,296,347
Dates.............do....	20,098,550	580,627	10,720,852	480,589	36,920,921	1,890,688
Figs..............do....	3,239,425	163,647	11,775,499	873,415	25,358,946	4,518,163
Grapefruit.............	....	....	....	[2] 156,524	....	611,129
Grapes.....cubic feet..	576,132	680,027	667,959	992,855	534,706	845,363
Lemons.................	....	1,877,093	....	1,858,049	....	2,437,802
Olives.........gallons..	4,367,767	1,820,009	2,665,781	1,327,812	3,753,962	2,338,881
Oranges................	....	141,555	....	116,553	....	52,790
Pineapples.............	....	943,115	....	845,906	....	1,045,882
Raisins.......pounds..	989,410	159,245	100,273	20,897	1,566,786	442,912
Other..................	....	2,010,170	....	1,843,681	....	4,609,089
Total fresh or dried...	....	22,449,176	....	24,512,280	....	37,023,636
Prepared or preserved....	....	723,096	....	541,874	....	1,290,510
Total fruits...........	....	23,172,272	....	25,054,154	....	38,314,146
Grain and grain products:						
Grain—						
Corn..........bushels..	1,654,373	1,982,690	1,990,361	1,975,979	11,212,717	10,966,911
Oats..............do....	1,982,840	1,282,902	1,443,700	1,244,493	609,128	469,638
Wheat...........do....	33,583,109	67,809,607	17,035,986	30,428,806	7,910,701	14,905,722
Total grain....do....	37,220,322	71,075,199	20,470,047	33,649,278	19,732,546	26,342,271

[1] Not stated. [2] July 1 to Dec. 31.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31— 1917 Quantity.	1917 Value.	1918 Quantity.	1918 Value.	1919 Quantity.	1919 Value.
VEGETABLE MATTER—con.						
Grain and grain products—Continued.						
Grain products—						
Bread and biscuit ....pounds..	(1)	$106,303	(1)	$72,331	993,194	$205,995
Macaroni, vermicelli, etc..........pounds..	1,023,386	76,196	402,010	40,925	902,551	101,859
Meal and flour—						
Wheat flour.barrels..	642,435	6,226,849	167,124	1,511,724	16,623	171,302
Other..................	....	6,266,407	....	4,190,840	....	6,533,747
Total grain products..............	....	12,675,755	....	5,815,820	....	7,012,903
Total grain and grain products...	....	83,750,954	....	39,465,098	....	33,355,174
Hay............long tons..	230,535	2,348,730	399,736	4,860,460	202,648	3,081,537
Hops.............pounds..	193,630	57,077	76,775	50,862	467,433	237,909
Indigo:						
Natural..........do....	3,642,490	5,101,668	1,747,074	2,194,367	227,474	260,115
Synthetic........do....			777,029	416,008	823,878	432,373
Licorice root.........do....	33,460,490	1,796,576	27,100,309	1,997,269	49,891,673	3,864,619
Liquors, alcoholic:						
Distilled spirits—						
Brandy....proof galls..	456,271	2,022,975	2,423	15,083	224	728
Cordials, liqueurs, etc., proof galls............	285,805	703,082	28,181	112,340	....	....
Gin........proof galls..	241,071	491,069	294	361	....	....
Whisky..........do....	1,643,314	4,839,366	6,326	18,584	....	....
Other............do....	380,492	537,590	44,561	44,181	9,615	10,556
Total distilled spirits, proof galls..........	3,006,953	8,594,082	81,785	190,549	9,839	11,284
Malt liquors—						
Bottled.......gallons..	471,362	593,104	142,965	202,535	8	9
Unbottled.......do....	1,110,000	531,596	208,268	134,389	....	....
Total malt liquors, gallons..............	1,581,362	1,124,700	351,233	336,924	8	9
Wines—						
Champagne and other sparkling...doz. qts..	170,687	3,011,589	68,313	1,264,099	9,274	211,162
Still wines—						
Bottled....doz. qts..	496,791	2,484,149	224,525	1,335,528	12,128	78,738
Unbottled..gallons..	2,944,812	2,576,219	1,918,813	1,919,431	215,481	223,689
Total still wines....	....	5,060,368	....	3,254,959	....	302,427
Total wines........	....	8,071,957	....	4,519,058	....	513,589
Total alcoholic liquors...........	....	17,790,739	....	5,046,531	....	524,882
Malt, barley. (*See* grain and grain products.)						
Malt liquors. (*See* liquors, alcoholic.)						
Nursery stock:						
Plants, trees, shrubs, and vines—						
Bulbs, bulbous roots or corms, cultivated for their flowers or foliage..........M..	223,564	2,613,710	103,666	1,572,522	147,843	3,465,602
Stocks, cuttings, and seedings ....M..	....	(1)	....	[2] 12,574	....	707,492
Other................	....	507,891	....	422,227	....	247,577
Total nursery stock..	....	3,121,601	....	2,007,323	....	4,420,671

[1] Not stated. [2] July 1 to Dec. 31.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Nuts:						
Almonds—						
Shelled.......pounds..	18,326,914	$4,608,822	21,544,757	$5,731,630	28,007,908	$10,582,179
Unshelled.......do....	4,455,533	508,619	6,149,374	947,761	7,482,538	1,305,167
Coconuts, unshelled, number................	(1)	2,610,494	(1)	2,490,368	85,081,922	4,053,282
Coconut meat, broken, copra—						
Not shredded, desiccated or prepared, pounds..............	366,700,360	19,167,058	430,649,332	26,262,895	258,915,789	16,544,613
Shredded, desiccated or prepared.pounds..	9,702,785	836,796	20,269,909	2,606,783	29,637,673	4,140,689
Cream and Brazil..do....	36,578,971	1,648,530	11,282,088	662,936	43,076,348	3,135,628
Filberts—						
Shelled..........do....	2,280,787	471,731	4,245,868	891,679	3,778,986	1,193,637
Unshelled.......do....	16,468,547	1,775,361	7,432,524	926,159	16,747,304	3,396,301
Marrons, crude....do....	....	....	[2] 66,100	[2] 3,003	5,012,194	393,803
Palm and palm-nut kernels...........pounds..	....	....	[2] 16,905,313	[2] 199,089	5,610,056	288,586
Peanuts—						
Shelled..........do....	42,578,009	2,011,976	67,746,831	4,275,731	24,179,687	1,933,904
Unshelled.......do....	7,688,669	325,869	1,970,797	128,623	5,667,354	393,534
Walnuts—						
Shelled..........do....	12,257,593	3,723,908	9,707,401	3,785,679	10,260,899	5,317,276
Unshelled.......do....	17,177,992	1,739,216	3,304,003	465,859	21,235,078	3,985,327
Other....................	....	1,310,609	....	552,088	....	846,238
Total nuts..........	....	40,738,989	....	49,930,283	....	57,510,164
Oil cake..........pounds..	43,188,260	539,687	37,780,061	1,764,574	112,405,870	2,370,827
Oils, vegetable:						
Fixed or expressed—						
Cocoa butter or butterine..........pounds..	815	193	3,049	872	1,460	530
Coconut oil.....do....	63,091,003	18,852,789	356,088,738	44,290,112	281,063,213	35,380,099
Cottonseed.......do....	13,826,028	1,211,878	18,372,867	2,215,299	27,805,784	3,672,984
Flaxseed or linseed, gallons...............	84,403	60,578	26,129	37,246	2,152,378	3,040,362
Nut oil, or oil of nuts, n. e. s.—						
Chinese nut.gallons..	5,478,798	4,006,143	5,695,751	6,386,576	7,180,346	8,120,529
Peanut........do....	3,653,938	2,672,506	9,128,860	8,530,808	20,540,317	22,009,89
Olive, for mechanical purposes....gallons..	596,815	569,534	357	140	282,454	435,190
Olive, edible.....do....	6,807,280	9,441,264	171,161	450,793	9,024,136	18,013,801
Palm oil......pounds..	34,257,396	3,561,025	20,993,085	1,651,241	41,817,945	4,317,324
Palm kernel.....do....	306	31	34,164	4,855	1,929,493	142,523
Rapeseed......gallons..	1,350,892	981,927	3,077,203	3,096,074	1,116,706	1,306,315
Soya bean....pounds..	264,925,783	21,191,262	335,984,148	38,454,730	195,808,421	24,019,226
Other..................	....	866,500	....	2,505,595	....	2,558,259
Total fixed or expressed............	....	63,415,630	....	107,624,341	....	123,017,035
Volatile or essential—						
Birch and cajeput, pounds...............	(1)	24,822	(1)	29,970	16,747	13,444
Lemon.......pounds..	569,936	434,997	587,969	436,080	607,286	612,033
Other...........do....	....	3,915,905	....	2,818,391	....	6,357,653
Total volatile or essential............	....	4,375,724	....	3,284,441	....	6,983,130
Total vegetable oils..	....	67,791,354	....	110,908,782	....	130,000,165
Opium, crude.....pounds..	124,764	1,538,803	159,621	2,675,963	730,272	8,279,663

[1] Not stated.

[2] July 1 to Dec. 31.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31— 1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Rice, rice meal, etc.:						
Rice—						
Cleaned.......pounds..	194,305,903	$6,024,869	424,692,417	$17,906,990	144,090,499	$9,904,689
Uncleaned, including paddy......pounds..	84,943,914	2,783,399	57,375,662	3,023,293	29,495,448	2,249,833
Rice flour, rice meal, and broken rice....pounds..	19,730,385	430,724	75,979,636	2,558,185	1,010,177	87,109
Total rice, etc..do....	298,980,202	9,238,992	558,047,715	23,488,468	174,596,124	12,241,631
Sago, tapioca, etc....do....	(1)	4,615,265	(1)	3,903,221	99,274,913	5,207,972
Seeds:						
Castor beans or seeds, bushels................	1,041,017	1,829,481	638,821	1,758,636	1,209,099	3,673,868
Clover—						
Red...........pounds..	3,966,685	671,827	931,307	176,111	7,025,591	2,410,056
Other............do....	7,914,323	1,133,945	8,588,659	1,908,173	18,016,407	4,991,908
Flaxseed or linseed, bushels................	9,394,287	25,445,704	12,974,476	32,993,739	14,036,184	44,360,095
Grass seed, n. e. s. pounds..	6,277,510	514,243	6,076,098	568,632	15,609,926	2,605,454
Mustard...........do....	....	....	4,449,323	278,600	14,226,213	1,259,931
Sugar beet.........do....	15,422,076	3,869,811	4,297,376	1,341,068	9,830,068	2,137,091
Other................	....	6,552,887	....	6,167,784	....	7,756,517
Total seeds..........	....	40,017,898	....	45,192,743	....	69,194,920
Spices:						
Unground—						
Capsicum.....pounds..	....	....	[2] 1,788,483	[2] 200,021	1,160,592	153,900
Cassia, or cassia vera, pounds..............	8,951,396	824,661	12,571,074	1,145,035	8,710,112	878,415
Cloves........pounds..	....	....	[2] 1,634,140	[2] 552,359	6,150,431	1,522,802
Ginger root, not preserved......pounds..	3,793,293	362,955	5,691,046	511,808	4,374,217	520,949
Nutmegs......pounds..	....	....	[2] 2,224,679	[2] 396,132	4,098,506	754,234
Pepper, black or white, pounds..............	35,829,674	5,460,473	48,869,467	8,042,814	22,826,245	3,703,443
Total unground, pounds............	48,574,363	6,648,089	72,778,889	10,848,169	47,320,103	7,533,743
Ground—						
Capsicum.....pounds..	....	....	[2] 1,443,578	[2] 415,434	1,561,212	500,890
Mustard.........do....	....	....	[2] 460,206	[2] 210,354	1,500,357	797,118
Other...........do....	26,232,042	3,785,380	16,167,745	2,625,041	6,060,164	971,885
Total ground..do....	26,232,042	3,785,380	18,071,529	3,250,829	9,121,733	2,269,893
Total spices...do....	74,806,405	10,433,469	90,850,418	14,098,998	56,441,836	9,803,636
Spirits, distilled. (*See* liquors, alcoholic.)						
Starch............pounds..	25,347,966	1,309,169	26,431,150	2,108,260	2,612,223	242,909
Sugar and molasses:						
Molasses.........gallons..	126,778,330	10,182,443	141,339,184	10,424,174	120,156,311	4,176,974
Sugar—						
Raw—						
Beet........pounds..	29,217	1,481	380	35	1,180	108
Cane...........do....	4,940,603,461	221,988,285	5,166,840,872	241,390,194	7,019,690,475	393,170,660
Maple sugar and sirup......pounds..	3,456,756	495,382	4,135,067	875,201	3,928,301	1,109,666
Total raw.pounds..	4,944,089,434	222,485,148	5,170,976,319	242,265,430	7,023,619,956	394,280,434
Total sugar and molasses.........	....	232,667,591	....	252,689,604	....	398,457,408

[1] Not stated. [2] July 1 to Dec. 31.

TABLE 282.—*Agricultural imports of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article imported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Tea..............pounds..	126,794,997	$25,763,075	134,418,201	$29,539,740	80,962,920	$20,145,864
Tobacco:						
Leaf—						
Wrapper......pounds..	5,393,862	7,096,788	7,313,100	10,448,547	7,775,481	10,158,480
Filler and other leaf, pounds............	52,565,963	26,374,966	76,201,015	41,674,442	78,210,136	64,987,084
Total tobacco..do....	57,959,825	33,471,754	83,514,115	52,122,989	85,985,617	75,145,564
Vanilla beans........do....	910,378	1,669,541	759,401	1,195,632	1,150,079	2,407,093
Vegetables:						
Fresh and dried—						
Beans........bushels..	4,343,068	15,264,882	4,209,639	18,416,310	4,972,456	17,526,911
Garlic.........pounds..	....	....	[1] 2,240,955	[1] 146,962	9,961,222	1,334,553
Onions.......bushels..	1,934,974	1,959,738	261,029	212,344	740,686	1,017,577
Peas, dried......do....	1,723,874	4,594,833	2,243,412	8,895,989	2,140,609	7,489,290
Potatoes—						
Irish...........do....	3,182,136	5,000,575	1,201,494	1,368,614	5,543,686	5,907,064
Sweet and desiccated or prepared........	....	....	....	4,862	....	480,141
Other.................	....	2,504,392	....	2,025,872	....	2,156,740
Total, fresh and dried.	....	29,324,420	....	31,070,953	....	35,912,276
Prepared or preserved—						
Mushrooms...pounds..	3,572,991	1,242,375	1,288,956	526,565	2,093,087	1,356,051
Pickles and sauces.....	....	567,445	....	336,858	....	1,194,943
Other.................	....	1,727,288	....	754,269	....	2,181,986
Total prepared or preserved..........	....	3,537,108	....	1,617,692	....	4,732,980
Total vegetables......	....	32,861,528	....	32,688,645	....	40,645,256
Vinegar...........gallons..	154,389	62,360	53,059	30,054	99,463	58,614
Wax, vegetable...pounds..	8,171,154	2,070,216	9,878,448	3,681,635	10,813,939	3,809,635
Wines. (*See* liquors, alcoholic).						
Total vegetable matter, including forest products........	....	1,321,468,074	....	1,285,312,252	....	1,772,033,057
Total vegetable matter, excluding forest products........	....	948,674,724	....	1,005,707,743	....	1,397,577,625
Total agricultural imports, including forest products.....	....	1,964,918,507	....	1,948,843,060	....	2,767,335,814
Total agricultural imports, excluding forest products.....	....	1,592,125,157	....	1,669,238,551	....	2,392,880,382

[1] July 1 to Dec. 31.

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919.*

Article exported.	Year ending Dec. 31— 1917 Quantity.	1917 Value.	1918 Quantity.	1918 Value.	1919 Quantity.	1919 Value.
ANIMAL MATTER.						
Animals, live:						
Cattle..........number..	20,009	$1,291,714	17,280	$1,082,758	69,859	$6,439,521
Horses.............do....	169,000	33,058,960	51,170	9,858,475	19,691	2,856,396
Mules..............do....	72,590	13,716,063	17,319	3,360,653	7,122	1,189,180
Sheep..............do....	30,359	278,759	7,962	120,882	34,531	369,974
Swine..............do....	15,588	276,451	10,308	333,729	24,745	683,911
Other (including fowls)...	....	383,903	....	288,645	....	464,702
Total live animals....	....	49,005,850	....	15,045,142	....	12,003,684
Beeswax..........pounds..	256,467	95,744	165,382	63,244	210,046	92,285
Dairy products:						
Butter.............do....	7,192,918	2,660,371	26,194,415	10,868,953	34,556,485	17,504,446
Cheese.............do....	53,371,527	13,295,706	48,404,672	11,735,266	14,159,721	5,349,577
Milk—						
Condensed.......do....	428,575,213	51,284,003	551,139,754	72,824,897	852,865,414	121,893,337
Other, including cream.	....	279,547	....	528,607	....	1,729,884
Total dairy products.	....	67,519,627	....	95,577,723	....	146,477,244
Eggs...............dozen..	19,886,079	7,270,543	20,938,278	8,428,214	38,789,470	18,812,231
Egg yolks.................	....	101,112	....	718,066	....	131,747
Feathers..................	....	353,103	....	252,903	....	863,250
Fibers, animal wool. pounds.	1,827,324	1,308,698	406,944	462,969	2,839,980	2,230,629
Glue...............do....	4,216,186	639,712	5,809,605	1,110,837	8,486,167	1,480,777
Honey..............do....	(1)	1,888,732	11,598,857	2,223,396	9,075,602	1,955,091
Packing-house products:						
Beef—						
Canned.......pounds..	65,471,232	18,258,522	141,457,163	51,498,010	53,867,327	20,672,964
Cured or pickled.do....	67,810,990	8,319,655	44,206,020	7,921,220	42,804,724	8,739,141
Fresh............do....	216,419,599	31,427,132	514,341,529	109,605,363	174,426,999	40,280,747
Oils, oleo oil.....do....	33,399,548	6,796,996	69,106,350	15,493,321	75,585,164	22,025,340
Oleomargarine...do....	3,522,540	693,150	8,909,108	2,398,908	22,939,589	6,576,760
Stearin...........do....	8,295,304	1,386,126	10,550,241	2,291,160	20,854,724	4,171,151
Tallow...........do....	7,510,376	1,192,287	4,222,657	745,977	38,953,783	6,370,112
Total beef......do....	402,429,589	68,073,868	792,793,068	189,953,959	429,432,310	108,836,215
Bones, hoofs, and horns, unmanufactured.......	....	173,159	....	307,671	....	370,634
Grease, grease scraps, and all soap stock—						
Lubricating............	....	3,022,087	....	3,003,081	....	6,039,701
Soap stock.............	....	3,051,454	....	2,730,208	....	6,656,035
Hair.....................	....	1,583,387	....	680,766	....	1,551,276
Hides and skins other than furs—						
Calfskins......pounds..	1,728,250	809,026	2,213,293	866,512	4,654,335	3,217,625
Cattle............do....	8,007,138	2,324,126	2,338,147	681,951	16,995,932	6,290,356
Horse............do....	21,685	6,108	54,471	13,864	467,420	135,176
Other............do....	1,635,160	648,325	499,148	215,493	2,805,964	1,252,164
Total...............	11,392,233	3,787,585	5,105,059	1,777,820	24,923,651	10,895,321
Lard compounds pounds................	49,300,143	8,582,320	43,977,410	10,258,536	124,962,950	31,605,885
Meat, canned, n. e. s......	....	5,420,841	....	8,819,996	....	12,950,669
Mutton.........pounds..	2,862,175	514,855	1,630,815	387,132	3,009,164	632,667
Oils, animal, n. e. s., gallons......	308,183	320,364	794,808	881,812	1,949,592	2,955,470
Pork—						
Canned.......pounds..	5,377,226	1,731,531	5,267,342	1,776,392	5,791,706	2,422,364

[1] Not stated

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ANIMAL MATTER—contd.						
Packing-house products—Continued.						
Pork—Continued.						
Cured—						
Bacon.........do....	578,128,056	$123,115,384	1,104,788,081	$315,968,064	1,190,297,494	$373,913,227
Hams and shoulders, pounds..........	243,386,814	54,047,798	537,213,041	145,674,888	596,795,663	189,428,837
Salted or pickled, pounds..........	39,294,011	7,088,935	36,671,660	8,535,017	34,113,875	8,632,518
Total cured........	860,808,881	184,252,117	1,678,672,782	470,177,969	1,821,207,032	571,974,582
Fresh.........pounds..	49,372,780	9,899,883	11,632,635	2,907,894	26,776,978	8,347,557
Lard.............do....	372,721,342	75,355,138	548,817,901	144,933,151	760,901,611	237,983,449
Lard, neutral....do....	9,423,385	2,015,320	6,307,164	1,612,780	22,957,137	7,725,983
Oils, lard oil[1] ..do....	1,852,102	272,474	335,010	75,109	1,086,915	220,029
Oils, lard oil[1] gallons..	246,947		44,668		144,922	
Total pork..pounds..	1,299,555,716	273,526,463	2,251,032,834	621,483,295	2,638,721,379	828,673,964
Sausage and sausage meats—						
Canned.......pounds..	6,730,577	1,500,643	6,349,602	1,817,199	8,198,336	2,761,944
Other............do....	11,264,664	3,570,864	6,029,354	2,125,373	13,889,285	5,911,850
Sausage casings....do....	7,758,214	2,839,432	4,037,391	2,611,680	25,477,028	6,809,834
All other..................	....	4,416,452	....	6,943,692	....	11,642,612
Total packing-house products..........	....	380,383,774	....	853,782,220	....	1,038,294,077
Poultry and game..........	....	1,756,681	....	935,048	....	4,560,278
Wool. (*See* Fibers, animal)						
Total animal matter.	....	510,323,576	....	978,979,762	....	1,226,901,293
VEGETABLE MATTER.						
Breadstuffs (*See* grain and grain products)						
Broom corn......long tons.	3,160	941,591	4,343	1,396,348	4,316	899,790
Cocoa, ground or prepared and chocolate............	....	5,102,813	....	6,961,457	....	21,380,801
Coffee:						
Green or raw....pounds..	46,035,832	6,696,780	43,031,687	6,365,160	28,289,105	7,295,511
Roasted or prepared, pounds................	2,556,209	502,817	1,694,928	296,642	6,062,449	1,521,070
Total coffee....do....	48,592,041	7,199,597	44,726,615	6,661,802	34,351,554	8,816,581
Cotton:						
Sea Island.....bales....	1,841	445,085	2,632	856,011	6,052	1,543,266
Sea Island.....pounds..	744,827		1,057,147		2,492,137	
Upland........bales....	4,369,146	550,906,338	3,964,700	664,386,262	6,526,173	1,134,817,274
Upland........pounds..	2,251,187,050		2,047,096,381		3,352,493,841	
Linters........bales....	447,856	23,952,359	145,017	8,880,517	24,962	1,010,712
Linters........pounds..	224,206,420		70,021,654		12,692,007	
Total cotton pounds..	2,476,138,297	575,303,782	2,118,175,182	674,122,790	3,367,677,985	1,137,371,252
Flavoring extracts and fruit juices....................	....	730,996	....	967,421	....	1,341,656
Flowers, cut................	....	130,938	....	173,991	....	171,407
Forest products:						
Barks, and extracts of, for tanning—						
Bark........long tons..	906	26,033	513	18,807	668	47,741
Bark, extracts of.......	....	3,372,417	....	3,125,842	....	5,598,134
Total bark, etc.......	....	3,398,450	....	3,144,649	....	5,645,875

[1] One gallon is estimated to weigh 7.5 pounds.

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Forest products—Contd.						
Logwood extract		[1] $1,404,709		$1,551,380		$1,355,936
Moss		84,928		91,667		91,475
Naval stores—						
Rosin……barrels	1,493,392	10,338,578	779,027	7,551,262	1,209,627	20,433,970
Tar, turpentine, and pitch……barrels	104,879	677,683	53,602	408,196	67,258	551,793
Turpentine, spirits of……gallons	6,517,389	3,384,920	3,717,093	2,276,523	10,672,102	10,448,234
Total naval stores		14,401,181		10,235,981		31,433,997
Wood—						
Logs and round timber—						
Fir……M feet	40,705	871,978	8,216	128,627	4,924	114,939
Pine, yellow…do			6,257	187,801	7,708	137,348
Other logs—						
Hardwood…do			1,153	60,026	6,663	250,606
Softwood…do			8,385	153,598	17,503	461,002
Total……do	40,705	871,978	24,011	530,052	36,798	963,895
Lumber—						
Boards, deals, and planks—						
Cypress……M feet	13,196	574,029	19,906	1,215,756	14,865	924,668
Fir……do	283,758	4,764,218	272,401	8,985,716	301,144	9,722,180
Gum……do	23,839	771,794	27,773	1,298,540	72,330	4,033,766
Oak……do	61,648	2,775,034	64,663	3,710,479	157,937	11,747,120
Pine—						
White……do	25,824	1,071,994	21,193	1,219,316	24,236	1,353,392
Yellow—						
Pitch pine, M feet	328,430	8,204,574	299,922	9,360,486	437,773	17,733,669
Short-leaf pine, M feet	3,983	101,605	12,267	398,224	19,884	829,160
Other pine, M feet	88,951	2,268,490	92,571	3,033,629	69,865	2,572,989
Poplar……do	10,492	550,159	23,488	1,556,209	35,645	2,694,694
Redwood……do	20,365	662,924	35,835	1,255,092	34,211	1,418,159
Spruce……do	63,655	4,688,193	70,675	7,943,976	21,685	1,919,407
Other—						
Hardwood.do	95,506	7,437,248	68,394	8,377,247	102,145	9,113,328
Softwood..do			14,681	822,848	19,490	798,274
Total……do	1,019,647	33,870,262	1,023,769	49,177,518	1,311,210	64,860,806
Railroad ties, number	3,800,241	2,717,009	2,681,823	2,308,171	4,699,902	4,178,525
Shingles……M	25,281	102,469	19,892	95,872	16,143	89,480
Shooks—						
Box		2,125,942		2,737,865		2,820,541
Cooperage, number	1,411,391	2,997,976	1,542,150	4,427,935	2,856,771	8,489,009
Other……number			363,426	758,359	479,585	545,707
Total shooks		5,123,918		7,924,159		11,855,257
Staves and heading—						
Heading		294,248		563,564		591,021
Staves……number	60,005,602	3,688,684	53,373,526	3,605,332	81,657,792	13,160,377
Total staves and heading		3,982,932		4,168,896		13,751,398
Other		2,126,627		2,348,459		3,790,325
Total lumber		47,923,217		66,023,075		98,526,791

[1] July 1 to Dec. 31.

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Forest products—Contd.						
Wood—Continued.						
Timber—						
Hewn—						
Hardwood . M feet..	8,697	$272,897	1,549	$82,892	3,740	$268,754
Softwood ....do....			4,537	120,756	4,759	145,759
Sawed—						
Pitch pine..do....	120,827	3,147,663	35,892	1,274,352	154,186	6,959,671
Other—						
Hardwood.do....	28,552	781,703	5,662	275,592	5,400	330,455
Softwood..do....			27,630	745,367	14,708	438,907
Total timber, M feet........	158,076	4,202,263	75,270	2,498,959	182,793	8,143,546
All other, including firewood............	....	246,634	....	176,319	....	365,107
Total wood..........	....	53,244,092	....	69,228,405	....	107,998,339
Wood alcohol ...gallons..	1,122,191	1,175,822	2,624,312	2,035,950	718,427	750,167
Wood pulp....long tons..	34,982	3,469,547	19,932	1,733,872	35,765	3,048,491
Total forest products.	....	77,178,729	....	88,021,904	....	150,324,280
Fruits:						
Fresh or dried—						
Apples, dried..pounds..	7,852,773	691,111	2,200,483	311,350	24,704,359	4,109,828
Apples, fresh..barrels..	958,104	4,496,707	579,916	3,135,203	1,712,367	14,471,282
Apricots, dried.pounds.	6,728,910	956,884	5,262,206	754,780	37,143,824	8,505,348
Berries................	....	849,764	....	887,561	....	1,181,742
Lemons........boxes..	154,321	583,000	193,347	1,088,823	306,916	1,371,848
Oranges..........do....	1,860,139	4,649,893	857,159	4,279,429	1,777,468	7,638,450
Peaches, dried..pounds.	6,523,700	616,782	4,839,598	544,455	9,022,334	1,559,873
Pears, fresh............	....	1,099,028	....	928,841	....	1,764,671
Prunes........pounds..	48,077,017	4,358,810	22,888,112	2,177,976	108,208,257	15,721,951
Raisins..........do....	48,446,153	4,401,824	52,657,814	4,668,021	110,183,033	13,089,366
Other—						
Dried................	....	4,068,061	....	752,868	....	2,557,451
Fresh................			....	3,396,709	....	4,713,008
Total, fresh or dried.	....	26,771,864	....	22,926,016	....	76,684,818
Preserved—						
Canned—						
Peaches..............	....	6,103,197	....	1,178,547	....	9,489,850
Other................			....	4,134,272	....	31,985,772
Other preserved........	....	756,301	....	1,989,945	....	4,518,343
Total preserved......	....	6,859,498	....	7,302,764	....	45,993,965
Total fruits..........	....	33,631,362	....	30,228,780	....	122,678,783
Ginseng..........pounds..	205,684	1,387,067	226,731	1,372,586	307,585	3,338,531
Glucose and grape sugar:						
Glucose.........pounds..	152,076,927	7,158,670	42,740,417	2,552,637	220,380,761	13,169,051
Grape sugar........do....	25,765,875	961,908	14,591,733	906,290	35,236,948	1,970,893
Grain and grain products:						
Grain—						
Barley........bushels..	17,858,849	26,207,499	18,805,219	30,565,377	37,611,840	53,832,319
Buckwheat......do....	121,636	194,333	1,420	3,021	186,074	307,454
Corn.............do....	52,167,683	72,936,631	39,899,091	69,269,329	11,192,533	18,624,386
Oats.............do....	98,677,544	71,351,798	114,462,932	98,221,637	55,294,479	46,435,294
Rye..............do....	13,411,496	25,871,354	7,631,639	15,615,618	32,898,166	61,786,232
Wheat...........do....	106,196,318	245,833,521	111,177,103	260,612,978	148,086,470	356,898,296
Total grain...........	288,433,526	442,395,136	291,977,404	474,287,960	285,269,562	537,883,981
Grain products—						
Bran and middlings, long tons............	6,833	280,859	7,372	327,285	4,517	233,114

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Grain and grain products—Continued.						
Grain—Continued.						
Breadstuff preparations—						
Bread and biscuit, pounds	14,202,243	$1,605,614	8,585,891	$1,277,704	12,827,005	$2,506,447
Other	....	10,327,734	....	6,854,197	....	8,819,138
Total breadstuff preparations	....	11,933,348	....	8,131,901	....	11,325,585
Distillers' and brewers' grains and malt sprouts....long tons..	961	38,632	217	13,394	1,960	125,886
Malt..........bushels..	4,163,267	6,800,085	896,307	1,694,651	10,045,941	16,694,614
Meal and flour—						
Barley flour.barrels..	([1])	([1])	[2] 360,073	[2] 3,877,852	255,845	2,572,396
Corn meal......do....	1,210,842	10,048,683	1,790,016	18,761,103	1,202,434	10,920,487
Oatmeal....pounds..	268,861,843	11,990,386	299,198,015	17,353,080	220,966,637	11,999,382
Rye flour....barrels..	212,890	2,088,150	1,446,075	15,449,730	1,266,030	12,424,508
Wheat flour....do....	13,926,117	138,438,813	21,706,700	244,653,422	26,449,881	293,452,748
Total meal and flour	....	162,566,032	....	300,095,187	....	331,369,521
Mill feed....long tons..	22,253	966,045	9,652	466,242	12,124	784,296
All other	....	1,431,770	....	5,751,037	....	3,803,972
Total grain products..	....	184,016,771	....	316,479,697	....	364,336,988
Total grain and grain products	....	626,411,907	....	790,767,657	....	902,220,969
Hay............long tons..	51,924	1,193,092	28,342	904,030	32,142	962,975
Hops..............pounds..	4,138,254	917,650	3,670,352	970,598	20,797,504	8,832,255
Lard compounds. (*See* packing-house products.)						
Liquors, alcoholic:						
Distilled spirits—						
Alcohol, including cologne spirits, proof gallons	20,237,500	7,650,209	8,557,165	4,704,743	20,311,166	8,966,819
Rum....proof gallons..	745,733	772,680	184,635	191,197	120,519	179,769
Whisky—						
Bourbon.......do....	51,520	96,806	57,454	160,265	247,553	1,101,568
Rye...........do....	111,202	221,255	72,910	240,300	842,942	1,560,816
Total whisky.do....	162,722	318,061	130,364	400,565	1,090,495	2,662,384
Other...........do....	418,240	498,126	136,322	452,034	247,238	689,549
Total distilled spirits, proof gallons	21,564,195	9,239,076	9,008,486	5,748,539	21,769,418	12,498,521
Malt liquors—						
Bottled.dozen quarts..	1,118,433	1,678,187	1,077,593	2,075,767	1,006,927	2,179,809
Unbottled....gallons..	234,409	57,091	97,160	35,479	36,638	16,474
Total malt liquors....	....	1,735,278	....	2,111,246	....	2,196,283
Wines...........gallons..	2,210,049	969,761	3,225,048	2,040,815	4,926,425	4,754,765
Total alcoholic liquors	....	11,944,115	....	9,900,600	....	19,449,569
Malt. (*See* Grain and grain products.)						
Malt liquors. (*See* Liquors, alcoholic.)						

[1] Not stated. [2] July 1 to Dec. 31.

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Malt sprouts. (*See* Grain and grain products.)						
Nursery stock	....	$228,043	....	$239,621	....	$405,270
Nuts:						
Peanuts........pounds..	12,891,286	1,093,368	12,319,004	1,602,657	19,778,490	2,123,411
Other	....	607,564	....	541,641	....	1,462,408
Total nuts	....	1,700,932	....	2,144,298	....	3,585,819
Oil cake and oil-cake meal:						
Corn............pounds..	5,536,886	115,538	69,379	2,966	963,980	26,874
Cottonseed—						
Cake.........pounds..	280,013,565	5,477,479	1,384,250	32,412	394,625,721	12,918,900
Meal...........do....	125,355,013	2,690,453	10,283,046	256,068	233,507,445	7,262,043
Flaxseed or linseed—						
Cake.........pounds.. }	311,899,061	7,280,565	45,392,709	1,115,129	327,922,678	11,656,844
Meal...........do.... }			40,561,673	1,134,142	25,828,805	846,387
Other..........do....	12,235,325	245,653	9,371,706	244,733	104,379,153	3,329,643
Total.........do....	735,039,850	15,809,688	107,062,754	2,785,450	1,087,227,782	36,040,691
Oils, vegetable:						
Fixed or expressed—						
Cocoa butter..pounds.. }	(1)	(1)	(1)	(1)	[2] 7,320,255	[2] 3,031,748
Coconut.........do.... }					[2] 110,611,743	[2] 24,601,142
Corn............do....	4,709,103	700,149	170,948	36,540	6,414,904	1,551,253
Cottonseed......do....	124,703,506	17,303,256	119,067,376	23,184,329	193,133,201	49,890,268
Linseed.......gallons..	1,528,625	1,699,897	774,192	1,162,054	1,502,178	2,606,885
Peanut.......pounds.. }	(1)	(1)	(1)	(1)	[2] 4,341,803	[2] 1,043,117
Soya bean.......do.... }					[2] 27,714,764	[2] 6,097,692
Other	....	3,428,456	....	4,087,932	....	18,507,128
Total fixed or expressed	....	23,131,758	....	28,470,855	....	98,329,234
Volatile or essential—						
Peppermint..pounds..	72,650	190,841	59,606	202,856	97,880	654,282
Other..........do....	....	1,068,796	....	744,997	....	1,367,388
Total volatile or essential	....	1,259,637	....	947,853	....	2,021,670
Total vegetable oils..	....	24,391,395	....	29,187,708	....	100,350,904
Rice.............pounds..	207,588,404	12,376,688	167,932,775	12,424,710	376,875,571	34,775,622
Roots, herbs, and barks, n. e. s	....	955,235	....	728,143	....	1,632,281
Seeds:						
Cotton seed.....pounds..	870,282	30,476	1,741,499	69,707	1,918,848	88,7433
Flaxseed or linseed, bushels	5,196	24,810	25,508	134,985	16,595	125,14
Grass and clover seed—						
Clover........pounds..	8,738,668	1,889,329	5,985,526	1,836,124	7,943,749	3,206,316
Timothy........do....	13,880,725	993,453	8,564,384	881,154	13,346,358	1,633,271
Other...........do....	5,426,305	807,379	2,952,193	542,704	4,440,490	717,102
Total grass and clover seed......pounds..	28,045,698	3,690,161	17,502,103	3,259,982	25,730,597	5,556,689
All other seeds	....	1,288,972	....	2,031,776	....	2,771,836
Total seeds	....	5,034,419	....	5,496,450	....	8,542,411
Spices	....	449,717	....	480,508	....	588,462
Spirits, distilled. (*See* Liquors, alcoholic.)						

[1] Not separately stated. [2] July 1 to Dec. 31.

TABLE 283.—*Agricultural exports (domestic) of the United States during the 3 years ending Dec. 31, 1919*—Continued.

Article exported.	Year ending Dec. 31—					
	1917		1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
VEGETABLE MATTER—con.						
Starch:						
Cornstarch......pounds..	108, 839, 068	$5, 303, 670	33, 619, 821	$1, 758, 557	179, 436, 736	$10, 219, 799
Other..............do....			16, 083, 388	1, 020, 071	89, 703, 821	5, 342, 366
Stearin, vegetable....do....	1, 261, 504	202, 799	1, 019, 560	233, 909	4, 158, 736	767, 386
Sugar, molasses, and sirup:						
Molasses.........gallons..	3, 932, 065	636, 554	5, 413, 982	1, 190, 911	6, 685, 784	1, 311, 217
Sirup..............do....	12, 314, 270	6, 574, 837	3, 184, 290	2, 012, 121	16, 731, 846	10, 299, 244
Sugar, refined...pounds..	1, 010, 795, 831	64, 395, 650	407, 296, 324	27, 038, 667	1,475,407,678	114, 737, 491
Total sugar, molasses, and sirup..........	....	71, 607, 041	....	30, 241, 699	....	126, 347, 952
Tobacco:						
Leaf............pounds..	251, 291, 892	45, 542, 000	403, 871, 275	122, 599, 767	765, 913, 164	259, 438, 483
Stems and trimmings, pounds.................	570, 980	31, 920	2, 955, 443	318, 384	10, 764, 971	547, 28
Total.......pounds..	251, 862, 872	45, 573, 920	406, 826, 718	122, 918, 151	776, 678, 135	259, 985, 764
Vegetables:						
Fresh or dried—						
Beans........bushels..	[1] 1, 833, 509	[1] 10, 130, 786	2, 398, 854	14, 226, 277	3, 795, 420	19, 965, 737
Onions..........do....	483, 302	878, 852	692, 855	1, 112, 074	816, 959	2, 095, 142
Peas, dried......do....	(2)	(2)	322, 452	1, 689, 457	476, 106	2, 664, 511
Potatoes.........do....	2, 422, 602	4, 241, 501	3, 853, 187	5, 834, 349	3, 642, 322	6, 475, 203
Total fresh or dried, bushels............	4, 739, 413	15, 251, 139	7, 267, 348	22, 862, 157	8, 730, 807	31, 200, 593
Prepared or preserved—						
Canned—						
Corn................	....	5, 450, 340	....	195, 632	....	548, 037
Soups................			....	1, 085, 173	....	1, 980, 624
Tomatoes............			....	479, 260	....	2, 127, 896
Other................			....	10, 659, 454	....	6, 698, 834
Pickles and sauces.....	....	844, 802	....	1, 129, 918	....	2, 039, 641
All other vegetables....	....	2, 215, 438	....	2, 204, 461	....	3, 237, 009
Total prepared or preserved..........	....	8, 510, 580	....	15, 753, 901	....	16, 632, 041
Total vegetables......	....	23, 761, 719	....	38, 616, 058	....	47, 832, 634
Vinegar...........gallons..	277, 586	55, 483	318, 975	89, 090	469, 316	135, 869
Wines. (*See* Liquors, alcoholic.)						
Yeast......................	....	820, 217	....	1, 202, 549	....	1, 099, 717
Total vegetable matter, including forest products...........	....	1,558,465,183	....	1,865,706,863	....	3,030,581,740
Total vegetable matter, excluding forest products..........	....	1,481,286,454	....	1,777,684,959	....	2,880,257,460
Total agricultural exports, including forest products.....	....	2,068,788,759	....	2,844,686,625	....	4,257,483,033
Total agricultural exports, excluding forest products.....	....	1,991,610,030	....	2,756,664,721	....	4,107,158,753

[1] Including dried peas. [2] Included in "Beans."

TABLE 284.—*Foreign trade of the United States in agricultural products, 1852–1919.*

[Compiled from reports of Foreign Commerce and Navigation of the United States. All values are gold.]

Year ending June 30—	Agricultural exports.[1]			Agricultural imports.[1]		Excess of agricultural exports (+) or of imports (—).
	Domestic.		Foreign.	Total.	Percentage of all imports.	
	Total.	Percentage of all exports.				
Average:						
1852–1856	$164,895,146	80.9	$8,059,875	$77,847,158	29.1	+$95,107,863
1857–1861	215,708,845	81.1	10,173,833	121,018,143	38.2	+104,864,535
1862–1866	148,865,540	75.7	9,287,669	122,221,547	43.0	+ 35,931,662
1867–1871	250,713,058	76.9	8,538,101	179,774,000	42.3	+ 79,477,159
1872–1876	396,666,397	78.5	8,853,247	263,155,573	46.5	+142,364,071
1877–1881	591,350,518	80.4	8,631,780	266,383,702	50.4	+333,598,596
1882–1886	557,472,922	76.3	9,340,463	311,707,564	46.8	+255,105,821
1887–1891	573,286,616	74.7	6,982,328	366,950,109	43.3	+213,318,835
1892–1896	638,748,318	73.0	8,446,491	398,332,043	51.6	+248,862,766
1897–1901	827,566,147	65.9	10,961,539	376,549,697	50.2	+461,977,989
1902–1906	879,541,247	59.5	11,922,292	487,881,038	46.3	+403,582,501
1907–1911	975,398,554	53.9	12,126,228	634,570,734	45.2	+352,954,048
1901	951,628,331	65.2	11,293,045	391,931,051	47.6	+570,990,325
1902	857,113,533	63.2	10,308,306	413,744,557	45.8	+453,677,282
1903	878,480,557	63.1	13,505,343	456,199,325	44.5	+435,786,575
1904	859,160,264	59.5	12,625,036	461,434,851	46.6	+410,350,439
1905	826,904,777	55.4	12,316,525	553,851,214	49.6	+285,370,088
1906	976,047,104	56.8	10,856,259	554,175,242	45.2	+432,728,121
1907	1,054,405,416	56.9	11,613,519	626,836,808	43.7	+439,182,127
1908	1,017,396,404	55.5	10,298,514	539,690,121	45.2	+488,004,797
1909	903,238,122	55.1	9,584,934	638,612,692	48.7	+274,210,364
1910	871,158,425	50.9	14,469,627	687,509,115	44.2	+198,118,937
1911	1,030,794,402	51.2	14,664,548	680,204,932	44.5	+365,254,018
1912	1,050,627,131	48.4	12,107,656	783,457,471	47.4	+279,277,316
1913	1,123,651,985	46.3	15,029,444	815,300,510	45.0	+323,380,919
1914	1,113,973,635	47.8	17,729,462	924,247,116	48.8	+207,456,481
1915	1,475,937,607	54.3	34,420,077	910,786,289	54.4	+599,571,395
1916	1,518,071,450	35.5	42,087,535	1,189,704,830	54.1	+370,454,155
1917	1,968,253,288	31.6	37,640,245	1,404,972,108	52.8	+600,921,425
1918	2,280,465,770	39.1	39,552,557	1,618,873,978	55.0	+701,144,349
Calendar year:						
1918	2,756,664,721	45.6	73,959,480	1,669,238,551	55.1	+1,161,385,650
1919 (preliminary)	4,107,158,753	53.0	122,540,608	2,392,880,382	61.3	+1,836,818,979

[1] Not including forest products.

TABLE 285.—*Value of principal groups of farm and forest products exported from and imported into the United States, 1918–1919.*

[Compiled from reports on the Foreign Commerce of the United States.]

Article.	Exports (domestic merchandise).			Imports.		
	Year ending June 30—	Year ending Dec. 31—		Year ending June 30—	Year ending Dec. 31—	
	1918	1918	1919	1918	1918	1919
FARM PRODUCTS.						
ANIMAL MATTER.						
Animals, live	$21,733,594	$15,045,142	$12,003,684	$21,958,378	$28,631,161	$58,037,361
Dairy products	85,910,866	95,957,723	146,477,244	8,380,393	6,940,202	12,863,812
Eggs	7,167,134	8,428,214	18,812,231	483,636	363,227	394,629
Feathers and downs, crude	302,236	252,903	863,250	1,959,180	1,520,199	3,550,956
Fibers, animal:						
Silk	....	....	....	190,624,766	194,198,598	341,886,776
Wool	916,506	462,969	2,230,629	198,545,911	251,772,616	216,764,501
Packing-house products	604,327,984	853,782,220	1,038,294,077	176,037,857	175,695,614	345,361,052
Other animal matter	5,182,390	5,050,591	8,220,178	6,016,153	4,409,191	16,443,670
Total animal matter	725,540,710	978,979,762	1,226,901,293	604,006,274	663,530,808	995,302,757
VEGETABLE MATTER.						
Argols or wine lees	....	....	....	5,443,628	4,824,504	4,286,972
Cocoa and chocolate	5,898,431	6,961,457	21,380,801	41,372,378	37,972,369	58,341,884
Coffee	6,286,180	6,661,802	8,816,581	103,058,536	99,423,362	261,270,106
Cotton	665,024,655	674,122,790	1,137,371,252	36,020,483	41,624,242	71,886,290
Fibers, vegetable, other	....	....	....	109,042,470	114,386,667	81,777,998
Fruits	32,207,364	30,228,780	122,678,783	24,408,810	25,054,154	38,314,146
Ginseng	1,717,548	1,372,586	3,338,531	....	....	....
Glucose and grape sugar	5,994,671	3,458,927	15,139,944	....	....	....
Grain and grain products	623,907,546	790,767,657	902,220,969	76,292,626	39,465,098	33,355,174
Hay	907,401	904,030	962,975	4,618,764	4,860,460	3,081,537
Hops	993,773	970,598	8,832,255	72,450	50,862	237,909
Indigo	....	....	....	3,895,114	2,610,375	692,488
Licorice root	....	....	....	1,853,927	1,997,269	3,864,619
Liquors, alcoholic	8,836,678	9,900,600	19,449,569	11,655,093	5,046,531	524,882
Nursery stock (plants, trees, etc.)	260,763	239,621	405,270	3,328,700	2,007,323	4,420,671
Nuts	2,263,314	2,144,298	3,585,819	52,850,788	49,930,283	57,510,164
Oil cake and oil-cake meal	4,994,193	2,785,450	36,040,691	574,032	1,764,574	2,370,827
Oil, vegetable	25,190,982	29,418,708	100,350,904	92,357,322	110,908,782	130,000,165
Opium, crude	....	....	....	2,443,228	2,675,963	8,279,653
Rice, rice flour, meal, and broken rice	14,174,513	12,424,710	34,775,622	16,311,705	23,488,468	12,241,631
Sago, tapioca, etc	....	....	....	5,530,889	3,903,221	5,207,972
Seeds	5,656,163	5,496,450	8,542,411	50,841,623	45,192,743	69,194,920
Spices	507,712	480,508	588,462	11,519,313	14,098,998	9,803,636
Starch	4,502,392	2,778,628	15,562,165	1,673,477	2,108,260	242,909
Sugar, molasses, and sirup	44,433,290	30,241,699	126,347,952	246,193,204	252,689,604	398,457,408
Tea	....	....	....	30,889,030	29,539,740	20,145,864
Tobacco	69,699,695	122,918,151	259,985,764	46,985,865	52,122,989	75,145,564
Vanilla beans	....	....	....	1,475.676	1,195,632	2,407,093
Vegetables	26,974,701	38,616,058	47,832,634	30,175,769	32,688,645	40,645,256
Wax, vegetable	....	....	....	2,693,258	3,681,635	3,809,635
Other vegetable matter	4,493,095	4,791,451	6,048,106	1,289,546	394,990	60,252
Total vegetable matter	1,554,925,060	1,777,684,959	2,880,257,460	1,014,867,704	1,005,707,743	1,397 577,625
Total farm products	2,280,465,770	2,756,664,721	4,107,158,753	1,618,873,978	1,669,238,551	2,392,880,382
FOREST PRODUCTS.						
Cork wood or cork bark	....	....	....	3,061,827	1,898,193	1,802,506
Dyewoods and extracts of	2,339,480	1,551,380	1,355,936	2,238,115	1,923,749	1,066,238
Gums, rubber	....	....	....	206,543,236	148,537,653	220,800,503
Gums, other than rubber	....	....	....	21,685,638	22,184,779	31,143,693
Naval stores	11,172,864	10,235,981	31,433,997	636	....	....
Tanning materials, n. e. s.	3,810,420	3,144,649	5,645,875	6,672,468	6,738,920	9,159,245

TABLE 285.—*Value of principal groups of farm and forest products exported from and imported into the United States, 1918–1919*—Continued.

Article.	Exports (domestic merchandise).			Imports.		
	Year ending June 30—	Year ending Dec. 31—		Year ending June 30—	Year ending Dec. 31—	
	1918	1918	1919	1918	1918	1919
FOREST PRODUCTS—Con.						
Wood:						
Cabinet, unsawed	....	....	....	$5, 045, 463	$5, 238, 743	$5, 270, 603
Lumber	$58, 919, 934	$66, 023, 075	$98, 525, 791	40, 405, 720	41, 980, 406	50, 406, 897
Pulp wood	....	....	....	11, 088, 422	13, 362, 566	10, 458, 753
Timber and logs	3, 959, 354	3, 029, 011	9, 107, 441	815, 247	823, 813	1, 987, 877
Rattan and reeds	....	....	....	1, 781, 239	1, 308, 465	872, 374
Wood pulp	3, 531, 304	1, 733, 872	3, 048, 491	31, 589, 090	31, 477, 175	37, 048, 381
Other forest products	2, 447, 412	2, 303, 936	1, 206, 749	4, 106, 358	4, 130, 047	4, 438, 362
Total forest products	87, 180, 768	88, 021, 904	150, 324, 280	335, 033, 459	279, 604, 509	374, 455, 432
Total farm and forest products	2, 367, 646, 538	2, 844, 686, 625	4, 257, 483, 033	1, 53, 907, 437	1, 948, 843, 060	2,767,335,814

TABLE 286.—*Exports of selected domestic agricultural products, 1852–1919.*

[Compiled from reports of Foreign Commerce and Navigation of the United States. Where figures are lacking, either there were no exports or they were not separately classified for publication. "Beef salted or pickled," and "Pork, salted or pickled," barrels, 1851–1865, were reduced to pounds at the rate of 200 pounds per barrel, and tierces, 1855–1865, at the rate of 300 pounds per tierce; cottonseed oil, 1910, pounds reduced to gallons at the rate of 7.5 pounds per gallon. It is assumed that 1 barrel of corn meal is the product of 4 bushels of corn, and 1 barrel of wheat flour the product of 5 bushels of wheat prior to 1880 and 4½ bushels of wheat in 1880 and subsequently.]

Year ending June 30—	Cattle.	Cheese.	Packing-house products.				
			Beef, cured—salted or pickled.	Beef, fresh.	Beef oils—oleo oil.	Beef tallow.	Beef and its products—total, as far as ascertainable.[1]
Average:	*Number.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1852–1856	1,431	6,200,385	25,980,520	....	....	7,468,910	33,449,430
1857–1861	20,294	13,906,430	26,985,880	....	....	13,214,614	40,200,494
1862–1866	6,531	42,683,073	27,662,720	....	....	43,202,724	70,865,444
1867–1871	....	52,880,978	26,954,656	....	....	27,577,269	54,531,925
1872–1876	45,672	87,173,752	35,826,646	....	....	78,994,360	114,821,006
1877–1881	127,045	129,670,479	40,174,643	69,601,120	....	96,822,695	218,709,987
1882–1886	131,605	108,790,010	47,401,470	97,327,819	30,276,133	48,745,416	225,625,631
1887–1891	244,394	86,354,842	65,613,851	136,447,554	50,482,249	91,608,126	411,797,859
1892–1896	349,032	66,905,798	64,898,780	207,372,575	102,038,519	56,976,840	507,177,430
1897–1901	415,488	46,108,704	52,242,288	305,626,184	139,373,402	86,082,497	637,268,235
1902–1906	508,103	19,244,482	59,208,292	272,148,180	156,925,317	59,892,601	622,843,230
1907–1911	253,867	9,152,083	46,187,175	144,799,735	170,530,432	66,356,232	448,024,017
1901	459,218	39,813,517	55,312,632	351,748,333	161,651,413	77,166,889	705,104,772
1902	392,884	27,203,184	48,632,727	301,824,473	138,546,088	34,065,758	596,254,520
1903	402,178	18,987,178	52,801,220	254,795,963	126,010,339	27,368,924	546,055,244
1904	593,409	23,335,172	57,584,710	299,579,671	165,183,839	76,924,174	663,147,095
1905	567,806	10,134,424	55,934,705	236,486,568	145,228,245	63,536,992	575,874,718
1906	584,239	16,562,451	81,088,098	268,054,227	209,658,075	97,567,156	732,884,572
1907	423,054	17,285,230	62,645,281	281,651,502	195,337,176	127,857,739	689,752,420
1908	349,210	8,439,031	46,958,367	201,154,105	212,541,157	91,397,507	579,303,478
1909	207,542	6,822,842	44,494,210	122,952,671	179,985,246	53,332,767	418,844,332
1910	139,430	2,846,709	36,554,266	75,729,666	126,091,675	29,379,992	286,295,874
1911	150,100	10,366,605	40,283,749	42,510,731	138,696,906	29,813,154	265,923,983
1912	105,506	6,337,559	38,087,907	15,264,320	126,467,124	39,451,419	233,924,626
1913	24,714	2,599,058	25,856,919	7,362,388	92,849,757	30,586,350	170,208,320
1914	18,376	2,427,577	23,265,974	6,394,404	97,017,065	15,812,831	151,212,009
1915	5,484	55,362,917	31,874,743	170,440,934	80,481,946	20,239,988	394,980,962
1916	21,287	44,394,301	38,114,682	231,214,000	102,645,914	16,288,743	457,555,572
1917	13,387	66,050,013	58,053,667	197,177,101	67,110,111	15,209,369	423,673,997
1918	18,213	44,303,076	54,467,910	370,032,900	56,603,388	5,014,964	600,132,371
Calendar year:							
1918	17,280	48,404,672	44,206,020	514,341,529	69,106,350	4,222,657	792,793,068
1919	69,859	14,159,721	42,804,724	174,426,999	75,585,164	38,953,783	429,432,310

[1] Includes canned, cured, and fresh beef, oleo oil, oleomargarine, tallow and stearin from animal fats.

TABLE 286.—*Exports of selected domestic agricultural products, 1852–1919*—Con.

Year ending June 30—	Packing-house products.					Apples, fresh.	Corn and corn meal (in terms of grain).
	Pork, cured—bacon.	Pork, cured—hams and shoulders.	Pork, cured—salted or pickled.	Pork—lard.	Pork and its products—total, as far as ascertainable.[1]		
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Barrels.*	*Bushels.*
Average:							
1852–1856	30,005,479	....	40,542,600	33,354,976	103,903,056	37,412	7,123,286
1857–1861	30,583,297	....	34,854,400	37,965,993	103,403,690	57,045	6,557,610
1862–1866	10,796,961	....	52,550,758	89,138,251	252,485,970	119,433	12,059,794
1867–1871	45,790,113	....	28,879,085	53,579,373	128,248,571	....	9,924,235
1872–1876	313,402,401	....	60,429,361	194,197,714	568,029,477	132,756	38,560,557
1877–1881	643,633,709	....	85,968,138	331,457,591	1,075,793,475	509,735	88,190,030
1882–1886	355,905,444	47,634,675	72,354,682	263,425,058	739,455,913	401,886	49,992,203
1887–1891	419,935,416	60,697,365	73,984,682	381,388,854	936,247,966	522,511	54,606,273
1892–1896	438,847,549	96,107,152	64,827,470	451,547,135	1,052,133,760	520,810	63,979,898
1897–1901	536,287,266	200,853,226	112,788,498	652,418,143	1,528,138,779	779,980	192,531,378
1902–1906	292,721,953	206,902,427	116,823,284	592,130,804	1,242,136,649	1,368,608	74,615,465
1907–1911	209,005,144	189,603,211	90,809,879	519,746,378	1,028,996,659	1,225,655	56,568,030
1901	456,122,741	216,571,803	138,643,611	611,357,514	1,462,369,849	883,673	181,405,473
1902	383,150,624	227,653,232	115,896,275	556,840,222	1,337,315,909	459,719	28,028,688
1903	207,336,000	214,183,365	95,287,374	490,755,821	1,042,119,570	1,656,129	76,639,261
1904	249,665,941	194,948,864	112,224,861	561,302,643	1,146,255,441	2,018,262	58,222,061
1905	262,246,635	203,458,724	118,887,189	610,238,899	1,220,031,970	1,499,942	90,293,483
1906	361,210,563	194,210,949	141,820,720	741,516,886	1,464,960,356	1,208,989	119,893,833
1907	250,418,699	209,481,496	166,427,409	627,559,660	1,268,065,412	1,539,267	86,368,228
1908	241,189,929	221,769,634	149,505,937	603,413,770	1,237,210,760	1,049,545	55,063,860
1909	244,578,674	212,170,224	52,354,980	528,722,933	1,053,142,056	896,279	37,665,040
1910	152,163,107	146,885,385	40,031,599	362,927,671	707,110,062	922,078	38,128,498
1911	156,675,310	157,709,316	45,729,471	476,107,857	879,455,006	1,721,106	65,614,522
1912	208,574,208	204,044,491	56,321,469	532,255,865	1,071,951,724	1,456,381	41,797,291
1913	200,993,584	159,544,687	53,749,023	519,025,384	984,696,710	2,150,132	50,780,143
1914	193,964,252	165,881,791	45,543,085	481,457,792	921,913,029	1,506,569	10,725,819
1915	346,718,227	203,701,114	45,655,574	475,531 908	1,106,180,488	2,351,501	50,668,303
1916	579,808,786	282,208,611	63,460,713	427,011,338	1,462,697,062	1,466,321	39,896,928
1917	667,151,972	266,656,581	46,992,721	444,769,540	1,501,948,125	1,739,997	66,753,294
1918	815,294,424	419,571,869	33,221,502	392,506,355	1,692,124,323	635,409	49,073,263
Calendar year:							
1918	1,104,788,081	537,213,041	36,671,660	548,817,901	2,251,032,834	579,916	47,059,155
1919	1,190,297,494	596,795,663	34,113,875	760,901,611	2,638,721,379	1,712,367	16,002,269

Year ending June 30—	Packing-house products.					Prunes.	Tobacco.
	Lard compounds.	Cotton.	Glucose and grape sugar.	Corn-oil cake and oil-cake meal.	Cottonseed-oil cake and oil-cake meal.		
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Average:							
1852–1856	....	1,110,498,083	....	....	....	....	140,183,800
1857–1861	....	1,125,715,497	....	....	....	....	167,710,800
1862–1866	....	137,582,133	....	....	....	....	140,207,850
1867–1871	....	902,410,338	....	....	....	....	194,753,537
1872–1876	....	1,218,805,497	....	....	....	....	241,848,410
1877–1881	....	1,738,892,268	....	....	....	....	266,315,190
1882–1886	....	1,968,178,266	4,473,550	....	....	....	237,941,913
1887–1891	....	2,439,650,456	27,686,298	....	....	....	259,248,361
1892–1896	....	2,736,655,351	125,574,007	....	....	....	281,746,279
1897–1901	21,792,477	3,117,909,578	209,279,772	....	1,005,099,895	....	304,401,701
1902–1906	52,951,358	3,632,267,952	154,866,980	21,888,135	1,066,790,196	48,550,774	325,538,515
1907–1911	75,765,251	4,004,770,051	145,064,738	61,732,807	989,738,130	47,039,287	334,395,923
1901	23,359,966	3,359,082,360	204,209,974	12,703,209	1,258,687,317	10,021,564	315,787,782
1902	36,201,744	3,528,974,636	130,419,611	14,740,498	1,050,466,246	23,358,819	301,007,365
1903	46,130,004	3,569,141,969	126,239,981	8,093,222	1,100,392,988	66,385,215	368,184,084
1904	53,603,545	3,089,855,906	152,768,716	14,014,885	820,349,073	73,146,214	311,971,831
1905	61,215,187	4,339,322,077.	175,250,580	24,171,127	1,251,907,996	54,993,849	334,302,091

[1] Includes canned, fresh, salted or pickled pork, lard, neutral lard, lard oil, bacon, and hams.

TABLE 286.—*Exports of selected domestic agricultural products, 1852–1919*—Contd.

Year ending Jund 30—	Packing-house products.						
	Lard compounds.	Cotton.	Glucose and grape sugar.	Corn-oil cake and oil-cake meal.	Cotton-seed oil cake and oil-cake meal.	Prunes.	Tobacco.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1906	67,621,310	3,634,045,170	189,656,011	48,420,942	1,110,834,678	24,869,744	312,227,202
1907	80,148,861	4,518,217,220	151,629,441	56,808,972	1,340,967,136	44,400,104	340,742,864
1908	75,183,210	3,816,998,693	129,686,834	66,127,704	929,287,467	28,148,450	330,812,658
1909	75,183,196	4,447,985,202	112,224,504	53,233,890	1,233,750,327	22,602,288	287,900,946
1910	74,556,603	3,206,708,226	149,820,088	49,108,598	640,088,766	89,014,880	357,196,074
1911	73,754,400	4,033,940,915	181,963,046	83,384,870	804,596,955	51,030,711	355,327,072
1912	62,522,888	5,535,125,429	171,156,259	72,490,021	1,293,690,138	74,328,074	379,845,320
1913	67,456,832	4,562,295,675	200,149,246	76,262,845	1,128,092,367	117,950,875	418,796,906
1914	58,303,564	4,760,940,538	199,530,874	59,030,623	799,974,252	69,813,711	449,749,982
1915	69,980,614	4,403,578,499	158,462,508	45,026,125	1,479,065,015	43,478,892	348,346,091
1916	52,843,311	3,084,070,125	186,406,182	18,996,490	1,057,221,569	57,422,827	443,293,156
1917	56,359,493	3,088,080,786	214,973,315	15,757,612	1,150,159,691	59,645,141	411,598,860
1918	31,278,382	2,320,511,665	97,858,301	457,584	44,680,793	32,926,546	289,170,686
Calendar year:							
1918	43,977,410	2,118,175,182	57,332,150	69,370	11,667,296	22,888,112	406,826,718
1919	124,962,950	3,367,677,985	255,617,709	963,980	628,133,166	108,208,257	776,678,135

Year ending June 30—	Hops.	Oils, vegetable—cotton-seed oil.	Rice and rice bran, meal, and polish.	Sugar, raw and refined.	Wheat.	Wheat flour.	Wheat and wheat flour (in terms of grain).
Average:	*Pounds.*	*Gallons.*	*Pounds.*	*Pounds.*	*Bushels.*	*Barrels.*	*Bushels.*
1852–1856	1,162,802	....	56,514,840	7,730,322	4,715,021	2,891,562	19,172,830
1857–1861	2,216,095	....	65,732,080	6,015,058	12,378,351	3,318,280	28,969,749
1862–1866	4,719,330	....	2,257,860	3,007,777	22,529,735	3,530,757	40,183,518
1867–1871	6,486,616	....	1,856,948	4,356,900	22,106,833	2,585,115	35,032,409
1872–1876	3,446,466	547,450	391,344	20,142,169	48,957,518	3,415,871	66,036,873
1877–1881	10,445,654	4,498,436	602,442	41,718,443	107,780,556	5,375,583	133,262,753
1882–1886	9,584,437	3,467,905	561,406	107,129,770	82,883,913	8,620,199	121,674,809
1887–1891	7,184,147	7,120,796	3,209,653	75,073,838	64,739,011	11,286,568	115,528,568
1892–1896	15,146,667	15,782,647	10,277,947	13,999,349	99,913,895	15,713,279	170,623,652
1897–1901	15,467,314	42,863,203	18,407,139	11,213,664	120,247,430	17,151,070	197,427,246
1902–1906	11,476,272	38,605,737	45,977,670	14,807,014	70,527,077	15,444,100	140,025,529
1907–1911	14,774,185	38,783,550	27,194,549	61,429,802	62,854,580	11,840,699	116,137,728
1901	14,963,676	49,356,741	25,527,846	8,874,860	132,060,667	18,650,979	215,990,073
1902	10,715,151	33,042,848	29,591,274	7,572,452	154,856,102	17,759,203	234,772,516
1903	7,794,705	35,642,994	19,750,448	10,520,156	114,181,420	19,716,484	202,905,598
1904	10,985,988	29,013,743	29,121,763	15,418,537	44,230,169	16,999,432	120,727,613
1905	14,858,612	51,535,580	113,282,760	18,348,077	4,394,402	8,826,335	44,112,910
1906	13,026,904	43,793,519	38,142,103	22,175,846	34,973,291	13,919,048	97,609,007
1907	16,809,534	41,880,304	30,174,371	21,237,603	76,569,423	15,584,667	146,700,425
1908	22,920,480	41,019,991	28,444,415	25,510,643	100,371,057	13,927,247	163,043,669
1909	10,446,884	51,087,329	20,511,429	79,946,297	66,923,244	10,521,161	114,268,468
1910	10,589,254	29,860,667	26,779,188	125,507,022	46,679,876	9,040,987	87,364,318
1911	13,104,774	30,069,459	30,063,341	54,947,444	23,729,302	10,129,435	69,311,760
1912	12,190,663	53,262,796	39,446,571	79,594,034	30,160,212	11,006,487	79,689,404
1913	17,591,195	42,031,052	38,908,057	43,994,761	91,602,974	11,394,805	141,132,166
1914	24,262,896	25,728,411	22,414,326	50,895,726	92,393,775	11,821,461	145,590,349
1915	16,210,443	42,448,870	77,480,065	549,007,411	259,642,533	16,182,765	332,464,975
1916	22,409,818	35,534,941	121,967,465	1,630,150,863	173,274,015	15,520,669	243,117,025
1917	4,824,876	21,188,236	181,372,310	1,248,908,286	149,831,427	11,942,778	203,573,928
1918	3,494,579	13,437,331	196,363,268	576,483,050	34,118,853	21,879,951	132,578,632
Calendar year:							
1918	3,670,352	15,875,650	167,932,775	407,296,324	111,177,103	21,706,700	208,857,253
1919	20,797,504	25,751,093	376,875,571	1,475,407,678	148,086,470	26,449,881	267,110,934

TABLE 287.—*Imports of selected agricultural products 1852–1919*

[Compiled from reports of Foreign Commerce and Navigation of the United States. Where figures are lacking, either there were no imports or they were not separately classified for publication. "Silk" includes, prior to 1881, only "Silk, raw or as reeled from the cocoon;" in 1881 and 1882 are included this item and "Silk waste:" after 1882, both these items and "Silk cocoons." From "Cocoa and chocolate" are omitted in 1860, 1861, and 1872 to 1881, small quantities of chocolate, the official returns for which were given only in value. "Jute and jute butts" includes in 1858 and 1859 an unknown quantity of "Sisal grass, coir, etc.," and in 1865–1868 an unknown quantity of "Hemp." Cattle hides are included in "Hides and skins other than cattle and goat" in 1895–1897. Olive oil for table use includes in 1862–1864 and 1885–1905 all olive oil. Sisal grass includes in 1884–1890 "Other vegetable substances." Hemp includes in 1885–1888 all substitutes for hemp.]

Year ending June 30—	Cheese.	Silk.	Wool.	Almonds.	Argols or wine lees.	Cocoa and chocolate, total.	Coffee.
Average:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1852–1856	1,053,983	....	19,067,447	3,460,807	....	2,486,572	196,582,863
1857–1861	1,378,147	....	....	3,251,091	....	3,063,893	216,235,090
1862–1866	....	....	....	2,482,063	1,354,947	2,453,141	124,551,992
1867–1871	....	681,669	....	....	2,360,529	3,502,614	248,726,019
1872–1876	....	1,094,948	....	....	4,951,473	4,857,364	307,006,928
1877–1881	....	1,922,269	62,744,282	....	12,403,256	6,315,488	384,282,199
1882–1886	....	4,672,846	83,293,800	....	17,551,967	11,568,173	529,578,782
1887–1891	8,335,323	6,564,121	117,763,889	5,860,728	21,433,570	18,322,049	509,367,994
1892–1896	9,649,752	8,382,892	162,640,491	7,487,676	26,469,990	25,475,234	597,484,217
1897–1901	12,588,515	10,962,210	163,979,079	7,361,198	24,379,847	38,209,423	816,570,082
1902–1906	22,165,754	17,187,544	193,656,402	10,920,881	27,647,440	70,901,254	980,119,167
1907–1911	37,662,812	22,143,461	199,562,649	15,297,414	29,350,692	113,673,368	934,533,322
1901	15,329,099	10,405,555	103,583,505	5,140,232	28,598,781	47,620,204	854,871,310
1902	17,067,714	14,234,826	166,576,966	9,868,982	29,276,148	52,878,587	1,091,004,252
1903	20,671,384	15,270,859	177,137,796	8,142,164	29,966,557	65,046,884	915,086,380
1904	22,707,103	16,722,709	173,742,834	9,838,852	24,571,730	75,070,746	995,043,284
1905	23,095,705	22,357,307	249,135,746	11,745,081	26,281,931	77,383,024	1,047,792,984
1906	27,286,866	17,352,021	201,688,668	15,009,326	28,140,835	84,127,027	851,668,933
1907	33,848,766	18,743,904	203,847,545	14,233,613	30,540,893	97,059,513	985,321,473
1908	32,530,830	16,662,132	125,980,524	17,144,968	26,738,834	86,604,684	890,640,057
1909	35,548,143	25,187,957	266,409,304	11,029,421	32,115,646	132,660,931	1,049,868,768
1910	40,817,524	23,457,223	263,928,232	18,556,356	28,182,956	111,070,834	871,469,516
1911	45,568,797	26,666,091	137,647,641	15,522,712	29,175,133	140,970,877	875,366,797
1912	46,542,007	26,584,962	193,400,713	17,231,458	23,661,078	148,785,846	885,201,247
1913	49,387,944	32,101,555	195,293,255	15,670,558	29,479,119	143,509,852	863,130,757
1914	63,784,313	34,545,829	247,648,869	19,038,405	29,793,011	179,364,091	1,001,528,317
1915	50,138,520	31,052,674	308,083,429	17,111,264	28,624,554	194,734,195	1,118,690,524
1916	30,087,999	41,925,297	534,828,022	16,596,921	34,721,043	245,579,101	1,201,104,485
1917	14,481,514	40,351,423	372,372,218	23,424,058	23,925,808	340,483,397	1,319,870,802
1918	9,839,305	43,680,988	379,129,934	23,840,145	30,267,382	399,312,278	1,143,890,889
Calendar year:							
1918	7,562,044	48,720,969	453,727,372	27,694,131	27,687,478	360,015,359	1,052,201,501
1919	11,332,204	55,522,372	445,892,834	35,490,446	25,735,599	392,364,512	1,333,564,067

Year ending June 30—	Corn.	Oats, including oatmeal.	Wheat.	Wheat flour.	Wheat, including wheat flour.	Flaxseed.	Unmanufactured tobacco.
Average:	*Bushels.*	*Bushels.*	*Bushels.*	*Barrels.*	*Bushels.*	*Bushels.*	*Pounds.*
1852–1856	....	....	2,121,796	411,282	4,178,206	1,132,629	5,043,620
1857–1861	....	....	2,617,432	....	2,617,432	....	5,153,792
1862–1866	....	....	....	....	....	1,037,352	....
1867–1871	74,952	....	1,296,079	104,412	1,818,139	....	5,630,647
1872–1876	57,200	[1] 514,840	1,308,183	74,391	1,680,138	2,915,448	8,885,648
1877–1881	42,445	[1] 126,074	870,941	7,107	906,476	1,223,577	7,870,781
1882–1886	24,223	....	506,765	2,305	517,137	1,541,095	13,671,581
1887–1891	14,833	117,994	338,927	2,882	351,896	1,833,065	21,640,477
1892–1896	8,057	105,179	1,629,393	937	1,633,609	1,180,741	25,871,080
1897–1901	4,304	54,216	1,273,798	1,452	1,280,332	404,476	16,957,809
1902–1906	20,280	93,750	872,694	26,797	993,280	233,588	33,804,555
1907–1911	91,893	[1] 1,649,535	286,354	93,210	705,799	3,248,633	42,812,615
1901	5,169	32,107	600,212	642	603,101	1,631,726	26,851,253
1902	18,278	38,978	118,612	420	120,502	477,157	29,428,837
1903	40,919	150,065	1,077,424	601	1,080,128	129,089	34,016,956
1904	16,633	183,983	6,852	46,851	217,682	213,270	31,162,636
1905	15,443	55,699	3,102,585	40,801	3,286,189	296,184	33,288,378

[1] Does not include oatmeal.

TABLE 287.—*Imports of selected agricultural products, 1852–1919*—Continued.

Year ending June 30—	Corn.	Oats, including oatmeal.	Wheat.	Wheat flour.	Wheat, including wheat flour.	Flaxseed.	Unmanufactured tobacco.
	Bushels.	*Bushels.*	*Bushels.*	*Barrels.*	*Bushels.*	*Bushels.*	*Pounds.*
1906	10,127	40,025	57,995	45,314	261,908	52,240	41,125,970
1907	10,818	91,289	375,433	47,702	590,092	90,356	40,898,807
1908	20,312	383,418	341,617	39,593	519,785	57,419	35,005,131
1909	258,065	6,691,700	41,082	92,413	456,940	593,668	43,123,196
1910	117,950	[1] 1,034,511	164,201	144,759	815,617	5,002,496	46,853,389
1911	52,322	[1] 107,318	509,439	141,582	1,146,558	10,499,227	48,203,288
1912	53,425	[1] 2,622,357	2,699,130	158,777	3,413,626	6,841,806	54,740,380
1913	903,062	[1] 723,899	798,028	107,558	1,282,039	5,294,296	67,977,118
1914	12,367,369	[1] 22,273,624	1,978,937	89,911	2,383,537	8,653,235	61,174,751
1915	9,897,939	[1] 630,722	426,469	64,200	715,369	10,666,215	45,809,213
1916	5,208,497	[1] 665,314	5,703,078	329,905	7,187,650	14,679,233	48,077,956
1917	2,267,299	[1] 761,644	24,138,817	174,704	24,924,985	12,393,988	49,105,119
1918	3,196,420	[1] 2,591,077	28,177,281	675,096	31,215,213	13,366,529	86,990,541
Calendar year:							
1918	1,990,361	[1] 1,443,700	17,035,986	167,124	17,788,044	12,974,476	83,514,115
1919	11,212,717	[1] 609,128	7,910,701	16,623	7,985,505	14,036,184	85,985,617

Year ending June 30—	Flax.	Hemp.	Hops.	Jute and jute butts.	Licorice root.	Manila.	Molasses.
Average:	*Long tons.*	*Long tons.*	*Pounds.*	*Long tons.*	*Pounds.*	*Long tons.*	*Gallons.*
1852–1856	1,143	1,574		3,244		12,084	28,488,888
1857–1861		2,652		17,239	1,372,573		30,190,875
1862–1866				3,213	1,887,892	15,566	34,262,933
1867–1871				14,909			53,322,088
1872–1876	4,170	22,711		49,188			44,815,321
1877–1881	4,260	22,458		62,496			32,638,963
1882–1886	5,678	30,557	1,618,879	91,058			35,019,689
1887–1891	7,021	36,919	7,771,672	104,887	59,275,373		30,543,299
1892–1896	6,785	5,409	2,386,240	84,111	86,444,974	47,354	15,474,619
1897–1901	7,008	4,107	2,381,899	93,970	87,475,620	47,217	6,321,160
1902–1906	8,574	5,230	5,205,867	101,512	99,543,395	60,813	17,191,821
1907–1911	9,721	6,368	6,769,965	100,420	96,111,469	67,289	24,147,348
1901	6,878	4,057	2,606,708	103,140	100,105,654	43,735	11,453,156
1902	7,772	6,054	2,805,293	128,963	109,077,323	56,453	14,391,215
1903	8,155	4,919	6,012,510	79,703	88,580,611	61,648	17,240,399
1904	10,123	5,871	2,758,163	96,735	89,463,182	65,666	18,828,530
1905	8,089	3,987	4,339,379	98,215	108,443,892	61,562	19,477,885
1906	8,729	5,317	10,113,989	103,945	102,151,969	58,738	16,021,076
1907	8,656	8,718	6,211,893	104,489	66,115,863	54,513	24,630,935
1908	9,528	6,213	8,493,265	107,533	109,355,720	52,467	18,882,756
1909	9,870	5,208	7,386,574	156,685	97,742,776	61,902	22,092,696
1910	12,761	6,423	3,200,560	68,155	82,207,496	93,253	31,292,165
1911	7,792	5,278	8,557,531	65,238	125,135,490	74,308	23,838,190
1912	10,900	5,007	2,991,125	101,001	74,582,225	68,536	28,828,213
1913	12,421	7,663	8,494,144	125,389	105,116,227	73,823	33,926,521
1914	9,885	8,822	5,382,025	106,033	115,636,131	49,688	51,410,271
1915	4,694	5,310	11,651,332	83,140	65,958,501	51,081	70,839,623
1916	6,939	6,506	675,704	108,322	41,003,295	78,892	85,716,673
1917	7,918	9,635	236,849	112,695	59,400,224	76,765	110,237,888
1918	5,607	6,813	121,288	78,312	26,982,932	86,220	130,730,861
Calendar year:							
1918	7,856	3,875	76,775	71,414	27,100,309	78,783	141,339,184
1919	4,420	1,698	467,433	62,332	49,891,673	68,536	120,125,795

[1] Does not include oatmeal.

TABLE 287.—*Imports of selected agricultural products, 1852–1919*—Continued.

Year ending June 30—	Olive oil, for table use.	Opium, crude.	Potatoes.	Rice and rice flour, rice meal, and broken rice.	Sisal grass.	Sugar, raw and refined.	Tea.
Average:	*Gallons.*	*Pounds.*	*Bushels.*	*Pounds.*	*Long tons.*	*Pounds.*	*Pounds.*
1852–1856	....	110,143	406,611	....	....	479,373,648	24,959,922
1857–1861	....	113,594	....	....	....	691,323,833	28,149,643
1862–1866	177,947	128,590	251,637	70,893,331	615	672,637,141	30,869,450
1867–1871	152,827	209,096	216,077	52,953,577	....	1,138,464,815	44,052,805
1872–1876	174,555	365,071	254,615	72,536,435	....	1,614,055,119	62,436,359
1877–1881	218,507	407,656	1,850,106	62,614,706	....	1,760,508,290	67,583,083
1882–1886	....	391,946	2,834,736	99,870,675	....	2,458,490,409	74,781,418
1887–1891	758,352	475,299	3,878,580	156,858,635	40,274	3,003,283,854	84,275,049
1892–1896	773,692	528,785	1,804,649	160,807,652	50,129	3,827,799,481	92,782,175
1897–1901	909,249	567,681	495,150	165,231,669	70,297	3,916,433,945	86,809,270
1902–1906	1,783,425	537,576	2,662,121	150,913,684	96,832	3,721,782,404	98,677,584
1907–1911	3,897,224	489,513	1,907,405	215,892,467	102,440	3,997,156,461	96,742,977
1901	983,059	583,208	371,911	117,199,710	70,076	3,975,005,840	89,806,453
1902	1,339,097	534,189	7,656,162	157,658,894	89,583	3,031,915,875	75,579,125
1903	1,494,132	516,570	358,505	169,656,284	87,025	4,216,108,106	108,574,905
1904	1,713,590	573,055	3,166,581	154,221,772	109,214	3,700,623,613	112,905,541
1905	1,923,174	584,680	181,199	106,483,515	100,301	3,680,932,998	102,706,599
1906	2,447,131	469,387	1,948,160	166,547,957	98,037	3,979,331,430	93,621,750
1907	3,449,517	565,252	176,917	209,603,180	99,061	4,391,839,975	86,368,490
1908	3,799,112	285,845	403,952	212,783,392	103,994	3,371,997,112	94,149,564
1909	4,129,454	517,388	8,383,966	222,900,422	91,451	4,189,421,018	114,916,520
1910	3,702,210	449,239	353,208	225,400,545	99,966	4,094,545,936	85,626,370
1911	4,405,827	629,842	218,984	208,774,795	117,727	3,937,978,265	102,563,942
1912	4,836,515	399,837	13,734,695	190,063,331	114,467	4,104,618,393	101,406,816
1913	5,221,001	508,433	327,230	222,103,547	153,869	4,740,041,488	94,812,800
1914	6,217,560	455,200	3,645,993	300,194,917	215,547	5,066,821,873	91,130,815
1915	6,710,967	484,027	270,942	277,191,472	185,764	5,420,981,867	96,987,942
1916	7,224,431	146,658	209,532	264,324,005	228,610	5,633,161,749	109,865,935
1917	7,533,149	86,812	3,079,025	216,048,858	143,407	5,332,745,854	103,364,410
1918	2,537,512	157,834	1,180,480	456,058,608	150,164	4,903,327,249	151,314,932
Calendar year:							
1918	171,161	159,621	1,201,494	558,047,715	151,876	5,170,976,319	134,418,201
1919	9,024,136	730,272	5,543,686	174,596,124	144,542	7,023,619,956	80,962,920

Year ending June 30—	Beeswax.	Onions.	Plums and prunes.	Raisins.	Currants.	Dates.	Figs.
Average:	*Pounds.*	*Bushels.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1887–1891	128,790	....	60,237,642	38,545,635	....	....	9,783,650
1892–1896	279,839	....	12,405,549	17,745,925	34,397,754	14,914,349	10,117,049
1897–1901	265,143	628,358	560,762	7,669,593	27,520,440	15,653,642	8,919,921
1902–1906	456,727	924,418	563,900	7,344,676	35,457,213	25,649,432	14,334,760
1907–1911	845,720	1,103,034	....	5,283,145	35,258,628	26,059,353	19,848,037
1901	213,773	774,042	745,974	3,860,836	16,049,198	20,013,681	9,933,871
1902	408,706	796,316	522,478	6,683,545	36,238,976	21,681,159	11,087,131
1903	488,576	925,599	633,819	6,715,675	33,878,209	43,814,917	16,482,142
1904	425,168	1,171,242	494,105	6,867,617	38,347,649	21,058,164	13,178,061
1905	373,569	856,366	671,604	4,041,689	31,742,919	19,257,250	13,364,107
1906	587,617	872,566	497,494	12,414,855	37,078,311	22,435,672	17,562,358
1907	917,088	1,126,114	323,377	3,967,151	38,392,779	31,270,899	24,346,173
1908	671,526	1,275,333	335,089	9,132,353	38,652,656	24,058,343	18,836,574
1909	764,937	574,530	296,123	5,794,320	32,482,111	21,869,218	15,235,513
1910	972,145	1,024,226	....	5,042,683	33,326,030	22,693,713	17,362,197
1911	902,904	1,514,967	....	2,479,220	33,439,565	29,504,592	23,459,728
1912	1,076,741	1,436,037	....	3,255,861	33,151,396	25,208,248	18,765,408
1913	828,793	789,458	....	2,579,705	30,843,735	34,304,951	16,837,819
1914	1,412,200	1,114,811	....	4,554,549	32,033,177	34,073,608	19,284,868
1915	1,561,506	829,177	....	2,808,806	30,350,527	24,949,374	20,779,730
1916	2,146,380	815,872	....	1,024,296	25,373,029	31,075,424	7,153,250
1917	2,685,982	1,757,948	....	1,850,219	10,476,534	25,485,361	16,479,733
1918	1,826,618	1,313,402	....	843,533	5,168,070	5,572,908	10,473,239
Calendar year:							
1918	1,558,048	261,029	....	100,273	5,091,328	10,720,852	11,775,499
1919	2,383,901	740,686	....	1,566,786	14,852,466	36,920,921	25,358,946

TABLE 287.—*Imports of selected agricultural products, 1852–1919*—Continued.

Year ending June 30—	Hides and skins, other than furs.			Macaroni, vermicelli, and all similar preparations.	Lemons.	Oranges.	Walnuts.
	Cattle.	Goat.	Other than cattle and goat.				
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Average:							
1897–1901	....	68,052,973	91,173,311	....	....	....	....
1902–1906	126,995,011	93,674,819	115,952,418	....	153,160,863	41,104,544	....
1907–1911	178,681,537	94,329,840	143,351,321	99,724,072	153,343,434	12,343,790	30,980,661
1901	129,174,624	73,745,596	77,989,617	....	148,514,614	50,332,914	....
1902	148,627,907	88,038,516	89,457,680	....	164,075,309	52,742,476	....
1903	131,644,325	85,114,070	102,340,303	28,787,821	152,004,213	56,872,070	12,362,567
1904	85,370,168	86,338,547	165,024,752	40,224,202	171,923,221	35,893,260	23,670,761
1905	113,177,357	97,803,571	126,893,934	53,441,080	139,084,321	28,880,575	21,684,104
1906	156,155,300	111,097,391	158,045,419	77,926,029	138,717,252	31,134,341	24,917,028
1907	134,671,020	101,201,596	135,111,199	87,720,730	157,859,906	21,267,346	32,597,592
1908	98,353,249	63,640,758	120,770,918	97,233,708	178,490,003	18,397,429	28,887,110
1909	192,252,083	104,048,244	148,253,998	85,114,003	135,183,550	8,435,873	26,157,703
1910	318,003,538	115,844,758	174,770,732	113,772,801	160,214,785	4,676,118	33,641,466
1911	150,127,796	86,913,842	137,849,757	114,779,116	134,968,924	7,672,186	33,619,434
1912	251,012,513	95,340,703	191,414,882	108,231,028	145,639,396	7,628,662	37,213,674
1913	268,042,390	96,250,305	207,903,995	106,500,752	151,416,412	12,252,960	26,662,441
1914	279,963,488	84,759,428	196,347,770	126,128,621	....	....	37,195,728
1915	334,341,417	66,547,163	137,439,153	56,542,480	....	....	33,445,838
1916	434,177,771	100,657,021	208,835,068	21,789,602	....	....	36,858,934
1917	386,600,028	105,640,307	207,967,162	3,472,503	....	....	38,725,362
1918	267,499,770	66,932,937	98,083,986	669,524	....	....	23,289,170
Calendar year:							
1918	221,051,070	62,363,549	78,476,280	402,010	....	....	13,011,404
1919	407,282,271	133,656,814	203,896,950	902,551	....	....	31,495,977

TABLE 288.—*Foreign trade of the United States in forest products, 1852–1919.*

[Compiled from reports of Foreign Commerce and Navigation of the United States. All values are gold.]

Year ending June 30—	Exports.		Imports.	Excess of exports (+) or of imports (−).
	Domestic.	Foreign.		
Average:				
1852–1856	$6,819,079	$694,037	$3,256,302	+ $4,256,814
1857–1861	9,994,808	962,142	6,942,211	+ 4,014,739
1862–1866	7,366,103	798,076	8,511,370	− 347,191
1867–1871	11,775,297	690,748	14,812,576	− 2,346,531
1872–1876	17,906,771	959,862	19,728,458	− 861,825
1877–1881	17,579,313	552,514	22,006,227	− 3,874,400
1882–1886	24,704,992	1,417,226	34,252,753	− 8,130,535
1887–1891	26,060,729	1,442,760	39,647,287	− 12,143,798
1892–1896	29,276,428	1,707,307	45,091,081	− 14,107,346
1897–1901	45,960,863	3,283,274	52,326,879	− 3,082,742
1902–1906	63,584,670	3,850,221	79,885,457	− 12,450,566
1907–1911	88,764,471	6,488,455	137,051,471	− 41,798,545
1901	55,369,161	3,599,192	57,143,650	+ 1,824,703
1902	48,928,764	3,609,071	59,187,049	− 6,649,214
1903	58,734,016	2,865,325	71,478,022	− 9,878,681
1904	70,085,789	4,177,352	79,619,296	− 5,356,155
1905	63,199,348	3,790,097	92,680,555	− 25,691,110
1906	76,975,431	4,809,261	96,462,364	− 14,677,672
1907	92,948,705	5,500,331	122,420,776	− 23,971,740
1908	90,362,073	4,570,397	97,733,092	− 2,800,622
1909	72,442,454	4,982,810	123,920,126	− 46,494,862
1910	85,030,230	9,801,881	178,871,797	− 84,039,686
1911	103,038,892	7,586,854	162,311,565	− 51,685,819
1912	108,122,254	6,413,343	172,523,465	− 57,987,868
1913	124,835,784	7,431,851	180,502,444	− 48,234,809
1914	106,978,554	4,517,766	155,261,300	− 43,764,980
1915	52,553,536	5,089,299	165,849,493	−108,206,658
1916	68,155,479	4,364,335	252,851,305	−180,331,491
1917	68,918,836	11,171,520	322,699,430	−242,609,074
1918	87,180,768	6,066,140	335,033,459	−241,786,551
Calendar year:				
1918	88,021,904	5,890,955	279,604,509	−185,691,650
1919 (preliminary)	150,324,280	6,899,403	374,455,432	−217,231,794

TABLE 289.—*Exports of selected domestic forest products, 1852–1919.*

[Compiled from reports of Foreign Commerce and Navigation of the United States. Where figures are lacking, either there were no exports or they were not separately classified for publication.]

Year ending June 30—	Lumber.			Rosin.	Spirits of turpentine.	Timber.	
	Boards, deals, and planks.[1]	Shooks, other than box.	Staves.			Hewn.	Sawed.
Average:	*M feet.*	*Number.*	*Number.*	*Barrels.*	*Gallons.*	*Cubic feet.*	*M feet.*
1851–1856	129,499			552,210	1,369,250		
1857–1861	205,476			664,206	2,735,104		
1862–1866	138,020			69,314	102,162		
1867–1871	138,720			491,774	2,693,412		
1872–1876	221,658			845,803		17,459,632	
1877–1881	303,114				7,138,556	18,316,876	
1882–1886	433,963			1,289,869	9,301,894	13,701,663	
1887–1891	531,755	593,054		1,533,834	10,794,025	6,401,543	218,796
1892–1896	616,090	435,581		2,006,427	14,258,928	6,062,418	263,641
1897–1901	957,218	668,797		2,477,696	18,349,386	5,146,927	428,755
1902–1906	212,476	765,215	51,234,056	2,453,280	16,927,090	3,968,469	508,212
1907–1911	1,649,203	925,828	56,181,900	2,355,560	16,658,955	3,406,245	479,776
1901	1,101,815	714,651	47,363,262	2,820,815	20,240,851	4,642,698	533,920
1902	942,814	788,241	46,998,512	2,535,962	19,177,788	5,388,439	412,750
1903	1,065,771	566,205	55,879,010	2,396,498	16,378,787	3,291,498	530,659
1904	1,426,784	533,182	47,420,095	2,585,108	17,202,808	3,788,740	558,690
1905	1,283,406	872,192	48,286,285	2,310,275	15,894,813	3,856,623	486,411
1906	1,343,607	1,066,253	57,586,378	2,438,556	15,981,253	3,517,046	552,548
1907	1,623,964	803,346	51,120,171	2,560,966	15,854,676	3,278,110	600,865
1908	1,548,130	900,812	61,696,949	2,712,732	19,532,583	4,883,506	463,440
1909	1,357,822	977,376	52,583,016	2,170,177	17,502,028	2,950,528	383,309
1910	1,684,489	928,197	49,783,771	2,144,318	15,587,737	3,245,196	451,721
1911	2,031,608	1,019,411	65,725,595	2,189,607	14,817,751	2,673,887	499,547
						M feet.	
1912	2,306,680	1,161,591	64,162,599	2,474,460	19,599,241	31,067	406,954
1913	2,550,308	1,710,095	89,005,624	2,806,046	21,093,597	34,502	477,135
1914	2,405,296	867,805	77,150,535	2,417,950	18,900,704	29,859	411,307
1915	1,129,205	620,043	39,297,268	1,372,316	9,464,120	6,118	167,671
1916	1,177,331	611,556	57,537,610	1,571,279	9,310,268	9,628	191,577
1917	1,041,845	1,079,510	61,469,225	1,638,590	8,841,875	7,293	177,072
1918	1,067,709	1,758,667	63,207,351	1,070,929	5,095,124	7,426	98,791
Calendar year:							
1918	1,023,769	1,905,576	53,373,526	779,027	3,717,093	6,086	69,184
1919	1,311,210	3,336,356	81,657,792	1,209,627	10,672,102	8,499	174,294

[1] Including "Joists and scantling" prior to 1884.

TABLE 290.—*Imports of selected forest products, 1852–1919.*

Year ending June 30—	Camphor, crude.	India rubber.	Rubber gums, total.	Lumber.		Shellac.	Wood pulp.
				Boards, deals, planks. and other sawed.	Shingles.		
	Pounds.	*Pounds.*	*Pounds.*	*M feet.*	*M.*	*Pounds.*	*Long tons.*
Average:							
1852–1856	213, 720						
1857–1861	360, 522						
1862–1866	386, 731					634, 276	
1867–1871			[1] 7, 389, 980				
1872–1876			12, 631, 388	564, 642	88, 197		
1877–1881	1, 515, 614		15, 610, 634	417, 907	55, 394		
1882–1886	1, 958, 608		24, 480, 997	577, 728	87, 760		
1887–1891	2, 273, 883		33, 226, 520	646, 745	181, 050	5, 086, 421	37, 251
1892–1896	1, 491, 902	38, 359, 547	39, 671, 553	661, 495		5, 848, 339	42, 771
1897–1901	1, 858, 018	47, 469, 136	52, 974, 744	566, 394		8, 839, 232	46, 827
1902–1906	2, 139, 183	57, 903, 641	75, 908, 633	727, 205	772, 340	11, 613, 967	120, 764
1907–1911	2, 939, 167	80, 129, 567	121, 504, 098	899, 659	866, 565	19, 046, 030	319, 007
1901	2, 175, 784	55, 275, 529	64, 927, 176	490, 820	555, 853	9, 608, 745	46, 757
1902	1, 831, 058	50, 413, 481	67, 790, 069	665, 603	707, 614	9, 064, 789	67, 416
1903	2, 472, 440	55, 010, 571	69, 311, 678	720, 937	724, 131	11, 590, 725	116, 881
1904	2, 819, 673	59, 015, 551	74, 327, 584	589, 232	770, 373	10, 933, 413	144, 796
1905	1, 904, 002	67, 234, 256	87, 004, 384	710, 538	758, 725	10, 700, 817	167, 504
1906	1, 668, 744	[2] 57, 844, 345	81, 109, 451	949, 717	906, 856	15, 780, 090	157, 224
1907	3, 138, 070	[2] 76, 963, 838	106, 747, 589	934, 195	881, 003	17, 785, 960	213, 110
1908	2, 814, 299	[2] 62, 233, 160	85, 809, 625	791, 288	988, 081	13, 361, 932	237, 514
1909	1, 990, 499	[2] 88, 359, 895	114, 598, 768	846, 024	1, 058, 363	19, 185, 137	271, 217
1910	3, 006, 648	[2] 101,044,681	154, 620, 629	1, 054, 416	762, 798	29, 402, 182	378, 322
1911	3, 726, 319	72, 046, 260	145, 743, 880	872, 374	642, 582	15, 494, 940	491, 873
1912	2, 154, 646	110, 210, 173	175, 965, 538	905, 275	514, 657	18, 745, 771	477, 508
1913	3, 709, 264	113, 384, 359	170, 747, 339	1, 090, 628	560, 297	21, 912, 015	502, 913
1914	3, 476, 908	131, 995, 742	161, 777, 250	928, 873	895, 028	16, 719, 756	508, 360
1915	3, 729, 207	172, 068, 428	196, 121, 979	939, 322	1, 487, 116	24, 153, 363	587, 922
1916	4, 574, 430	267, 775, 557	304, 182, 814	1, 218, 068	1, 769, 333	25, 817, 509	507, 048
1917	6, 884, 950	333, 373, 711	364, 913, 711	1, 175, 180	1, 924, 139	32, 539, 522	699, 475
1918	3, 638, 384	389, 599, 015	414, 983, 610	1, 282, 647	1, 878, 465	22, 913, 256	504, 108
Calendar year:							
1918	3, 474, 282	325, 959, 308	340, 023, 193	1, 208, 912	1, 797, 612	18, 663, 717	516, 258
1919	2, 693, 822	535, 940, 421	565, 931, 299	1, 147, 945	1, 987, 480	24, 426, 103	567, 872

[1] Includes "Gutta-percha" only for 1867. [2] Includes "Guayule gum," crude.

TABLE 291.—*Principal farm products imported from specified countries into the United States, 1918 and 1919.*

Country of origin, and article.	Year ending June 30, 1918.		Year ending Dec. 31—			
			1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Brazil:						
Cocoa (crude)....pounds..	91,351,529	$8,383,383	66,007,884	$6,304,535	69,990,057	$10,446,164
Coffee................do....	743,958,456	60,890,926	599,991,374	51,001,506	787,312,293	160,038,196
British West Indies:						
Bananas........bunches..	2,064,274	727,747	3,033,262	1,012,927	6,912,779	2,907,597
Cocoa............pounds..	51,438,970	6,295,562	51,535,501	6,347,610	30,199,700	6,535,744
Canada: Tea..........do....	1,914,169	647,712	2,294,155	821,516	2,257,012	772,397
China: Tea...........do....	21,082,866	4,361,557	14,202,680	3,214,057	10,557,985	2,730,103
Colombia: Coffee.....do....	112,159,390	13,198,462	118,909,462	14,767,367	150,483,853	30,425,162
Cuba:						
Bananas........bunches..	1,151,165	482,046	972,426	403,387	1,515,832	615,718
Sugar (raw)......pounds..	4,560,749,643	219,461,319	4,953,689,419	230,813,948	6,686,141,983	373,705,611
Dominican Republic: Cocoa................pounds..	39,851,184	3,660,091	38,099,255	3,895,981	44,665,321	7,408,772
Ecuador: Cocoa.......do....	76,786,657	7,975,868	68,920,773	7,109,114	46,404,529	6,735,350
France:						
Cheese..............do....	1,026,117	528,926	542,010	289,581	680,867	561,543
Olive oil (salad)..gallons..	227,617	576,602	88,088	268,075	183,124	699,291
Italy:						
Cheese...........pounds..	16,044	7,883	5,044	3,352	373,807	121,596
Macaroni...........do....	484	40	....	....	....	....
Olive oil (salad)..gallons..	200,403	467,692	5,729	20,535	251,902	750,397
Japan: Tea.........pounds..	52,996,471	9,511,283	56,436,650	12,745,767	39,959,916	10,219,053
Mexico: Coffee........do....	31,118,513	3,336,131	19,849,230	2,103,777	29,567,469	5,434,884
Netherlands:						
Cheese..............do....	....	....	....	....	4,947	3,133
Coffee..............do....	....	....	....	....	1,335	455
Philippine Islands: Sugar, pounds....................	173,600,941	7,913,247	135,602,975	6,163,183	175,872,529	7,940,722
Portugal: Cocoa...pounds..	134,904	20,912	....	....	1,087,271	224,904
Spain:						
Olive oil (salad)..gallons..	2,091,400	2,783,691	65,895	127,756	8,557,416	16,456,169
Goatskins........pounds..	806,152	845,714	626,569	706,967	1,501,018	2.537,101
Switzerland: Cheese..do....	....	....	....	....	12,354	8,186
United Kingdom:						
Cocoa...............do....	1,038,142	113,304	478,421	50,246	7,257,064	1.300,630
Tea..................do....	487,063	248,678	381,799	211,898	534,647	190,595

TABLE 292.—*Principal farm products exported to specified countries from the United States, 1918 and 1919.*

Country to which consigned, and article.	Year ending June 30, 1918.		Year ending Dec. 31— 1918		Year ending Dec. 31— 1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Belgium:						
Corn.............bushels..	3,714,233	$7,277,381	3,467,151	$6,371,356	1,009,969	$1,607,493
Wheat..............do....	6,007,986	13,674,261	12,628,186	30,107,271	24,476,490	59,901,083
Bacon............pounds..	68,670,327	17,200,008	67,444,015	18,909,533	90,823,427	28,040,950
Hams and shoulders..do....	....	....	5,853,423	1,387,335	30,054,740	8,899,197
Lard...............do....	116,154,490	28,105,585	116,784,152	31,757,658	155,802,228	46,338,651
Brazil: Wheat flour..barrels..	101,927	1,149,284	596	4,864	279,564	3,384,773
Canada:						
Corn.............bushels..	7,895,892	13,127,564	13,228,954	19,530,071	6,542,025	10,690,552
Wheat..............do....	252,540	577,965	26,493,421	61,464,108	1,421,613	3,314,818
Wheat flour........barrels..	83,334	884,042	61,045	621,523	7,316	80,154
Bacon............pounds..	42,837,136	11,744,199	24,454,474	7,465,376	34,253,197	10,767,992
Hams and shoulders..do....	14,286,628	3,787,253	11,112,784	3,098,318	7,457,307	2,191,013
Lard...............do....	893,977	208,131	2,478,926	669,571	5,090,459	1,454,658
Pork, pickled.........do....	13,689,396	3,065,724	14,708,735	3,355,902	8,372,796	2,179,707
China: Wheat flour..barrels..	275	2,791	2	25	3,913	41,992
Cuba:						
Corn.............bushels..	1,142,293	2,094,937	1,074,099	1,841,445	1,964,540	3,441,163
Wheat flour........barrels..	679,689	7,733,557	541,564	5,894,603	1,408,698	15,648,989
Bacon............pounds..	20,293,559	5,521,432	16,101,208	4,449,579	15,956,981	4,179,328
Hams and shoulders..do....	9,990,141	2,669,458	8,707,061	2,512,966	9,863,103	3,112,929
Lard...............do....	52,574,278	14,337,227	46,008,414	13,044,755	44,766,460	14,111,770
Pork, pickled.........do....	8,935,072	2,148,796	7,659,439	1,893,101	6,560,984	1,702,245
Denmark: Corn.....bushels..	....	....	....	....	334,711	602,472
France:						
Wheat..............do....	3,837,927	9,428,203	6,386,134	14,675,271	27,590,718	66,552,585
Bacon............pounds..	73,531,892	19,301,977	98,496,402	27,131,653	178,431,224	50,462,536
Lard...............do....	33,427,329	8,603,286	35,841,676	9,349,535	96,296,935	27,958,403
Hongkong: Wheat flour, barrels....................	1,250	13,825	....	....	10,597	110,902
Italy:						
Wheat............bushels..	6,756,191	15,579,424	16,337,436	38,263,712	38,264,883	91,054,928
Lard.............pounds..	2,136,645	506,717	1,145,112	273,258	2,463,197	806,057
Japan: Wheat flour...barrels..	69	794	....	....	2,528	27,850
Mexico:						
Corn.............bushels..	3,272,754	6,871,144	2,736,239	5,739,810	133,887	246,746
Wheat..............do....	2,126	3,849	1,564	3,755	134,003	329,187
Lard.............pounds..	6,957,993	1,625,892	15,452,095	4,451,219	7,134,448	2,127,709
Netherlands:						
Corn.............bushels..	246,004	456,009	46,004	92,009	100,168	167,192
Wheat..............do....	155,550	380,224	2,236,354	5,770,866	1,962,249	4,848,540
Wheat flour........barrels..	69,253	690,141	105,090	1,284,629	1,682,207	12,795,766
Bacon............pounds..	....	....	....	....	112,028,898	33,836,052
Lard...............do....	....	....	....	....	68,596,924	22,377,490
Lard neutral..........do....	....	....	....	....	9,313,883	3,169,227
Oleo oil...............do....	....	....	....	....	4,811,612	1,367,792
Norway: Oleo oil.......do....	774,004	175,106	....	....	8,656,192	2,620,902
Philippine Islands: Wheat flour..............barrels..	549	5,442	22	337	54,904	620,288
United Kingdom:						
Corn.............bushels..	21,197,784	39,118,255	15,658,493	29,041,245	948,493	1,585,886
Wheat..............do....	15,129,803	36,470,014	43,146,559	100,848,344	44,818,552	107,503,619
Wheat flour........barrels..	10,055,827	112,664,938	10,013,533	113,037,706	10,440,148	115,699,430
Bacon............pounds..	533,135,385	147,983,735	789,253,478	229,883,046	507,184,219	167,505,052
Hams and shoulders..do....	372,722,508	95,792,492	470,415,228	127,586,544	338,028,382	109,685,518
Lard...............do....	159,959,165	38,855,685	309,987,044	78,985,740	219,306,542	68,323,623
Oleo oil...............do....	48,244,317	10,184,472	57,783,111	12,782,449	20,791,549	6,113,654
Pork, pickled.........do....	1,903,144	447,141	2,102,744	616,636	3,378,871	963,487

TABLE 293.—*Shipments of principal domestic farm and forest products from the United States to Hawaii and Porto Rico, 1918-1919.*

[These shipments are not included in the domestic exports from or imports into the United States.

Possession and article.	Year ending June 30, 1918.		Year ending Dec. 31—			
			1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
HAWAII.						
Dairy products........pounds..	4,057,847	$878,447	3,575,998	$862,249	5,054,231	$1,260,186
Meat products..................	....	740,107	....	731,503	....	1,113,263
Grain and grain products.......	....	3,039,729	....	2,869,165	....	3,381,584
Rice...................pounds..	8,651,147	594,698	7,565,857	571,309	15,575,417	1,419,217
Lumber.........................	....	1,494,241	....	1,719,981	....	2,341,824
PORTO RICO.						
Dairy products........pounds..	5,692,110	1,062,646	5,584,422	1,143,961	5,392,805	1,217,876
Meat products..................	....	5,011,966	....	5,112,821	....	5,641,371
Beans and dried peas.bushels..	218,608	1,259,334	207,422	1,250,800	363,738	1,222,602
Grain and grain products.......	....	4,310,180	....	3,399,106	....	5,848,986
Rice...................pounds..	125,131,832	9,144,940	82,263,122	6,427,624	163,949,679	12,765,739
Sugar.....................do....	3,017,215	245,074	194,926	14,961	806,282	74,313
Tobacco...................do....	2,003,224	637,872	1,143,793	441,963	803,638	253,142
Lumber.........................	....	1,074,992	....	972,768	....	1,200,631

TABLE 294.—*Shipments of principal domestic farm products from Hawaii and Porto Rico to the United States, 1918-1919.*

Possession and article.	Year ending June 30, 1918.		Year ending Dec. 31—			
			1918		1919	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
HAWAII.						
Coffee..................pounds..	1,968,080	$275,733	4,485,843	$620,682	3,144,351	$652,837
Pineapples, canned.............	....	8,394,307	....	11,553,243	....	17,640,710
Sugar...................pounds..	1,080,908,797	64,108,540	1,009,749,843	56,894,325	1,158,904,433	76,305,959
PORTO RICO.						
Grapefruit..............boxes..	549,825	1,120,330	445,083	922,881	401,174	904,589
Oranges...................do....	602,987	1,230,984	509,020	1,053,334	355,226	795,678
Pineapples.....................	....	617,496	....	610,722	....	437,218
Molasses and sirup....gallons..	14,495,752	1,213,382	14,071,657	1,475,206	15,551,493	1,185,360
Sugar...................pounds..	672,937,334	41,310,845	801,329,419	49,359,333	728,391,059	52,782,811
Tobacco, leaf.............do....	13,124,315	7,913,675	11,450,647	6,831,689	15,819,142	10,143,049

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919.*

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
ANIMAL MATTER.								
Cattle:	*Number.*	*Number.*	*Number.*	*Number.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Canada	9,105	7,286	7,314	11,192	10.4	40.0	42.3	16.0
Mexico	7,341	7,777	7,885	23,923	8.4	42.7	45.6	34.2
United Kingdom	66,422	19	....	....	75.8	.1	......	......
Other countries	4,757	3,131	2,081	34,744	5.4	17.2	12.1	49.8
Total	87,625	18,213	17,280	69,859	100.0	100.0	100.0	100.0
Horses:								
Canada	24,486	18,064	13,032	9,848	87.2	21.3	25.5	50.0
Cuba	1,212	4,468	2,930	737	4.3	5.3	5.7	3.7
Mexico	1,197	4,775	749	5,438	4.3	5.6	1.5	27.6
United Kingdom	522	56,215	33,547	98	1.9	66.3	65.6	.5
Other countries	656	1,243	912	3,570	2.3	1.5	1.7	18.2
Total	28,073	84,765	51,170	19,691	100.0	100.0	100.0	100.0
Butter:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
Canada	499,942	44,749	12,518	274,893	11.7	.3	.1	.8
Central American States and British Honduras	694,345	633,753	521,152	666,713	16.2	3.6	2.0	1.9
Mexico	369,271	223,091	313,615	429,608	8.6	1.3	1.2	1.2
United Kingdom	601,095	13,982,559	22,250,115	21,817,613	14.1	78.8	84.9	63.1
Venezuela	599,600	6,402	2,970	35,563	14.0	(1)	(1)	.1
West Indies and Bermuda	1,361,406	1,380,404	1,775,416	2,249,201	31.8	7.8	6.8	6.5
Other countries	152,296	1,465,008	1,318,629	9,082,894	3.6	8.2	5.0	26.4
Total	4,277,955	17,735,966	26,194,415	34,556,485	100.0	100.0	100.0	100.0
Meat products:								
Beef products—								
Beef, canned—								
United Kingdom	5,129,188	46,375,149	51,250,973	13,947,951	54.6	47.6	36.2	25.9
Other countries	4,262,934	50,968,134	90,206,190	39,919,376	45.4	52.4	63.8	74.1
Total	9,392,122	97,343,283	141,457,163	53,867,327	100.0	100.0	100.0	100.0
Beef, fresh—								
Panama	5,026,662	144,442	357,366	51,950	17.1	(1)	.1	(1)
United Kingdom	23,410,437	285,789,315	466,080,785	73,073,602	79.5	77.2	86.7	41.9
Other countries	1,015,203	84,099,143	67,903,378	101,301,447	3.4	22.8	13.2	58.1
Total	29,452,302	370,032,900	514,341,529	174,426,999	100.0	100.0	100.0	100.0
Beef, pickled and other cured—								
Canada	1,386,090	2,623,317	2,044,979	1,373,553	4.2	4.8	1.6	3.2
Germany	3,617,862	....	....	2,567,542	11.0	......	......	6.0
Newfoundland and Labrador	4,941,896	5,505,008	5,418,221	5,676,761	15.1	10.1	12.3	13.3
United Kingdom	7,902,166	4,205,291	3,228,816	5,569,743	24.1	7.7	7.3	13.0
West Indies and Bermuda	4,548,476	2,215,472	1,690,183	1,404,620	13.9	4.1	3.8	3.3
Other countries	10,413,273	39,888,819	31,823,821	26,212,505	31.7	73.3	72.0	61.2
Total	32,809,763	54,467,910	44,206,020	42,804,724	100.0	100.0	100.0	100.0
Oleo oil [2]—								
Denmark	5,714,442	30,000	30,000	8,025,918	5.0	.1	(1)	10.6
Germany	20,068,668	....	....	2,126,704	17.6	......	......	2.8
Netherlands	57,084,122	....	....	4,811,612	50.2	......	......	6.4
Norway	8,335,573	774,004	....	8,656,192	7.3	1.4	......	11.5
Sweden	2,350,272	13,313	2,240,000	3,494,255	2.1	(1)	3.2	4.6
Turkey in Europe	3,869,784	....	....	2,635,801	3.4	......	......	3.5
United Kingdom	9,117,005	48,244,317	57,783,111	20,791,549	8.0	85.2	83.6	27.5
Other countries	7,217,847	7,541,754	9,053,239	25,043,133	6.4	13.3	13.2	33.1
Total	113,757,713	56,603,388	69,106,350	75,585,164	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

[2] For "Oleo oil" the average is for 4 years, 1911–1914.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
ANIMAL MATTER—contd.								
Meat products—Contd.								
Beef products—Contd.								
Lard compounds—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Cuba	19,793,565	7,735,338	8,608,423	8,611,137	29.4	24.7	19.6	6.9
Mexico	5,399,201	4,441,734	6,886,888	4,620,050	8.0	14.2	15.7	3.7
United Kingdom	20,830,150	4,416,476	4,345,867	62,739,201	30.9	14.1	9.9	50.2
Other countries	21,295,941	14,684,834	24,136,232	48,992,562	31.7	47.0	54.8	39.2
Total	67,318,857	31,278,382	43,977,410	124,962,950	100.0	100.0	100.0	100.0
Pork products—								
Bacon—								
Belgium	4,901,373	68,670,327	67,444,015	90,823,427	2.7	8.4	6.1	7.6
Canada	4,964,662	42,837,136	24,454,474	34,253,197	2.7	5.3	2.1	2.9
Cuba	7,696,815	20,293,559	16,101,208	15,956,981	4.2	2.5	1.5	1.3
France	2,689,203	73,531,892	98,496,402	178,431,224	1.5	9.0	8.9	15.0
Italy	7,560,557	74,459,980	98,079,060	48,128,149	4.1	9.1	8.9	4.0
Netherlands	4,408,989	......	......	112,028,898	2.4	......	......	9.4
Norway	3,637,518	25,243	......	26,152,222	2.0	(1)	......	2.2
Sweden	1,909,280	48	1,680,601	51,891,124	1.0	(1)	.2	4.4
United Kingdom	133,760,286	533,135,385	789,253,478	507,184,219	73.3	......	71.4	42.6
Other countries	10,945,409	2,340,854	9,278,843	125,448,053	6.1	.3	.9	10.6
Total	182,474,092	815,294,424	110,788,081	1,190,297,494	100.0	100.0	100.0	100.0
Hams and shoulders, cured—								
Belgium	7,863,470	......	5,853,423	30,054,740	4.7	......	1.1	5.0
Canada	4,509,867	14,286,628	11,112,784	7,457,307	2.7	3.4	2.1	1.2
Cuba	4,696,184	9,990,141	8,707,061	9,863,103	2.8	2.4	1.6	1.7
United Kingdom	143,087,022	372,722,508	470,415,228	338,028,382	85.8	88.8	87.6	56.6
Other countries	6,656,591	22,572,592	41,124,545	211,392,131	4.0	5.4	7.6	35.5
Total	166,813,134	419,571,869	537,213,041	596,795,663	100.0	100.0	100.0	100.0
Lard—								
Belgium	17,076,171	116,154,490	116,784,152	155,802,228	3.6	29.6	21.3	20.5
Canada	10,181,941	893,977	2,478,926	5,090,459	2.1	.2	.5	.7
Cuba	41,378,503	52,574,278	46,008,414	44,766,460	8.7	13.4	8.4	5.9
Denmark	2,480,647	75,000	75,000	33,505,333	.5	(1)	(1)	4.4
Ecuador	3,369,460	1,810,527	1,339,946	2,407,180	.7	.5	.2	.3
France	12,089,618	33,427,329	35,841,676	96,296,935	2.5	8.5	6.5	12.7
Germany	142,311,431	......	......	39,495,017	30.0	......	......	5.2
Italy	4,655,944	2,136,645	1,145,112	2,463,197	1.0	.5	.2	.3
Mexico	7,000,932	6,957,993	15,452,095	7,134,448	1.5	1.8	2.8	.9
Netherlands	36,501,329	......	......	68,596,924	7.7	......	......	9.0
Peru	2,784,573	1,400,455	1,080,095	944,742	.6	.4	.2	.1
United Kingdom	169,176,230	159,959,165	309,987,044	219,306,542	35.7	40.8	56.5	28.8
Other countries	25,348,135	17,116,496	18,625,441	85,092,146	5.4	4.3	3.4	11.2
Total	474,351,914	392,506,355	548,817,901	760,901,611	100.0	100.0	100.0	100.0
Lard, neutral[3]—								
Denmark	2,250,893	......	......	5,445,681	5.2	......	......	23.7
Germany	9,228,140	......	......	950,837	21.2	......	......	4.1
Netherlands	25,078,158	......	......	9,313,883	57.6	......	......	40.6
Norway	2,679,054	322,932	......	1,653,325	6.1	7.6	......	7.2
United Kingdom	1,871,448	3,495,665	5,433,851	2,000,074	4.3	82.1	86.2	8.7
Other countries	2,463,857	439,932	873,313	3,593,337	5.6	10.3	13.8	15.7
Total	43,571,550	4,258,529	6,307,164	22,957,137	100.0	100.0	100.0	100.0
Pork, pickled—								
British Guiana	1,539,772	863,280	1,040,430	205,700	3.2	2.6	2.8	.6
Canada	10,117,759	13,689,396	14,708,735	8,372,796	21.0	41.2	40.1	24.5
Cuba	7,286,791	8,935,072	7,659,439	6,560,984	15.1	26.9	20.9	19.2
Haiti	1,818,119	481,190	739,655	464,678	3.8	1.4	2.0	1.4
Newfoundland and Labrador	5,920,365	3,220,600	6,303,799.	4,833,214	12.3	9.7	17.2	14.2
Panama	1,426,985	276,782	135,720	124,683	3.0	.8	.4	.4
United Kingdom	10,225,205	1,903,144	2,102,744	3,378,871	21.2	5.7	5.7	9.9
Other countries	9,939,933	3,852,038	3,981,138	10,172,949	20.4	11.7	10.9	29.8
Total	48,274,929	33,221,502	36,671,660	34,113,875	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

[3] For "Lard, neutral," the average is for four years, 1911–1914.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
VEGETABLE MATTER.								
Cotton:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Austria-Hungary	48,200,615	....	....	48,609,352	1.1	....	....	1.4
Belgium	91,891,387	....	....	81,894,621	2.1	....	....	2.4
Canada	76,708,788	124,986,426	148,561,448	83,405,725	1.7	5.4	7.0	2.5
France	543,310,082	329,276,533	289,714,337	398,168,968	12.3	14.2	13.7	11.8
Germany	1,257,474,563	....	....	77,914,351	28.5	....	....	2.3
Italy	250,388,023	184,606,646	194,528,036	280,849,977	5.7	8.0	9.2	8.3
Japan	148,287,700	291,772,827	299,728,224	440,520,341	3.4	12.6	14.2	13.1
Mexico	10,601,091	5,353,162	1,992,554	345,852	.2	.2	.1	[1]
Netherlands	12,177,934	5,049,224	....	105,261,030	.3	.2	....	3.1
Russia, European	43,788,355	7,972,533	....	155,015	1.0	.3	....	[1]
Spain	134,932,086	129,596,749	122,197,270	126,076,028	3.1	5.6	5.8	3.7
Sweden	18,142,436	517,866	16,550,343	43,099,176	.4	[1]	.8	1.3
United Kingdom	1,754,711,933	1,193,550,402	997,866,017	1,619,088,787	39.7	51.4	47.1	48.1
Other countries	29,187,164	47,829,297	47,036,953	62,288,762	.5	2.1	2.1	2.0
Total	4,419,802,157	2,320,511,665	2,118,175,182	3,367,677,985	100.0	100.0	100.0	100.0
Fruits;								
Apples, dried—								
Germany	17,473,832	....	....	10,759	49.7	....	....	[1]
Netherlands	9,612,942	....	....	490,503	27.4	....	....	2.0
Other countries	8,050,439	2,602,590	2,200,483	24,203,097	22.9	100.0	100.0	98.0
Total	35,137,213	2,602,590	2,200,483	24,704,359	100.0	100.0	100.0	100.0
Apples, fresh—	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*				
Canada	221,431	457,948	331,453	158,859	14.3	72.1	57.2	9.3
Germany	157,020	....	....	8	10.1	....	....	[1]
United Kingdom	1,020,968	1,766	125,987	1,209,855	65.8	.3	21.7	70.7
Other countries	151,834	175,695	122,476	343,645	9.8	27.6	21.1	20.0
Total	1,551,253	635,409	579,916	1,712,367	100.0	100.0	100.0	100.0
Apricots, dried—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
Belgium	956,675	....	250	1,921,532	4.9	....	[1]	5.2
Canada	1,117,625	1,388,275	1,809,357	724,844	5.7	26.5	34.4	2.0
France	2,558,956	465,525	365,100	8,328,363	13.2	8.9	6.9	22.4
Germany	5,208,071	....	....	30,473	26.8	....	....	.1
Netherlands	2,204,930	....	....	1,140,230	11.3	....	....	3.1
United Kingdom	5,552,246	787,913	1,169,333	7,633,498	28.6	15.1	22.2	20.6
Other countries	1,839,506	2,587,905	1,918,166	17,364,884	9.5	49.5	36.5	46.6
Total	19,438,009	5,229,618	5,262,206	37,143,824	100.0	100.0	100.0	100.0
Oranges—	*Boxes.*	*Boxes.*	*Boxes.*	*Boxes.*				
Canada	1,135,194	1,190,629	827,529	1,633,421	95.7	96.0	96.5	91.9
Other countries	50,988	49,848	29,630	144,047	4.3	4.0	3.5	8.1
Total	1,186,182	1,240,477	857,159	1,777,468	100.0	100.0	100.0	100.0
Prunes—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
Belgium	5,005,565	....	150	3,172,934	6.2	....	[1]	2.9
Canada	11,327,559	18,025,903	12,772,178	14,519,219	14.1	54.7	55.8	13.4
France	10,226,468	2,490,874	746,459	10,498,370	12.7	7.6	3.3	9.7
Germany	29,420,239	....	....	15,758	36.6	....	....	[1]
Netherlands	7,238,048	....	....	567,668	9.0	....	....	.5
United Kingdom	8,847,965	4,827,806	4,120,030	29,445,779	11.0	14.7	18.0	27.2
Other countries	8,361,806	7,581,963	5,249,295	49,988,529	10.4	23.0	22.9	46.3
Total	80,427,650	32,926,546	22,888,112	108,208,257	100.0	100.0	100.0	100.0
Fruits, canned—	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*				
United Kingdom	2,715,863	3,029,606	1,811,083	34,359,305	68.5	43.1	34.1	82.8
Other countries	1,247,786	3,994,860	3,501,736	7,116,317	31.5	56.9	65.9	17.2
Total	3,963,649	7,024,466	5,312,819	41,475,622	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
VEGETABLE MATTER—continued.								
Glucose and grape sugar:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Argentina	5,571,728	1,950,255	1,793,900	6,341,204	3.1	2.0	3.1	2.5
British Oceania	8,631,878	445,019	108,836	1,246,848	4.8	.5	.2	.5
United Kingdom	145,950,270	55,825,847	39,345,968	159,033,298	80.8	57.0	68.6	62.2
Other countries	20,370,027	39,637,180	16,083,446	88,996,359	11.3	40.5	28.1	34.8
Total	180,523,903	97,858,301	57,332,152	255,617,709	100.0	100.0	100.0	100.0
Grain and grain products:								
Corn—	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*				
Belgium	1,387,953	3,714,233	3,467,151	1,009,969	3.5	9.1	8.7	9.0
Canada	8,379,334	7,895,892	13,228,954	6,542,025	21.0	19.3	33.2	58.4
Cuba	2,300,521	1,142,293	1,074,099	1,964,540	5.8	2.8	2.7	17.6
Denmark	2,493,820	...	...	334,711	6.3	...	...	3.0
Germany	5,251,554	...	...	...	13.1	...	...	...
Mexico	2,500,803	3,272,754	2,736,239	133,887	6.3	8.0	6.9	1.2
Netherlands	5,111,282	246,004	46,004	100,168	12.8	.6	.1	.9
United Kingdom	10,906,171	21,197,784	15,658,493	948,493	27.4	51.7	39.2	8.5
Other countries	1,498,252	3,528,867	3,688,151	158,740	3.8	8.5	9.2	1.4
Total	39,809,690	40,997,827	39,899,091	11,192,533	100.0	100.0	100.0	100.0
Wheat—								
Belgium	7,195,138	6,007,986	12,628,186	24,476,490	12.6	17.6	11.4	16.5
Canada	1,776,247	252,540	26,493,421	1,421,613	3.1	.7	23.8	1.0
France	3,001,698	3,837,927	6,386,134	27,590,718	5.3	11.2	5.7	18.6
Germany	6,154,503	...	...	...	10.8	...	...	...
Italy	2,367,307	6,756,191	16,337,436	38,264,883	4.2	19.8	14.7	25.8
Japan	2,338,152	...	...	...	4.1	...	...	...
Mexico	1,178,864	2,126	1,564	134,003	2.1	(1)	(1)	.1
Netherlands	8,350,709	155,550	2,236,354	1,962,249	14.7	.5	2.0	1.3
United Kingdom	21,806,112	15,129,803	43,146,559	44,818,552	38.3	44.3	38.8	30.3
Other countries	2,744,498	1,976,730	3,947,449	9,417,962	4.8	5.9	3.6	6.4
Total	56,913,228	34,118,853	111,177,103	148,086,470	100.0	100.0	100.0	100.0
Wheat flour—	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*				
Brazil	567,444	101,927	596	279,564	5.3	.5	(1)	1.1
British West Indies	472,953	196,507	110,582	221,346	4.4	.9	.5	.8
Canada	82,821	83,334	61,045	7,316	.8	.4	.3	(1)
China	263,882	275	2	3,913	2.5	(1)	(1)	(1)
Cuba	856,239	679,689	541,564	1,408,698	8.0	3.1	2.5	5.3
Finland	243,856	...	...	41,729	2.3	...	...	.2
Germany	187,457	...	...	42,324	1.8	...	...	.2
Haiti	233,932	10,924	378	268,243	2.2	(1)	(1)	1.0
Hongkong	1,121,139	1,250	...	10,597	10.5	(1)	...	(1)
Japan	612,879	69	...	2,528	5.7	(1)	...	(1)
Netherlands	818,637	69,253	105,090	1,082,207	7.7	.3	.5	4.1
Norway	212,713	214,810	192,086	45,715	2.0	1.0	.9	.2
Philippine Islands	278,717	549	22	54,904	2.6	(1)	(1)	.2
United Kingdom	2,712,639	10,055,827	10,013,533	10,440,148	25.4	46.0	46.1	39.5
Other countries	2,013,327	10,465,537	10,680,802	12,540,649	18.8	47.8	49.2	47.4
Total	10,678,635	21,879,951	21,706,700	26,449,881	100.0	100.0	100.0	100.0
Hops:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
British Oceania	516,882	31,760	319,069	244,487	3.3	.9	8.7	1.2
Canada	968,680	660,779	749,503	2,493,098	6.2	18.9	20.4	12.0
United Kingdom	13,880,669	102,896	76,424	12,523,653	89.3	2.9	2.1	60.2
Other countries	181,525	2,699,144	2,525,356	5,536,266	1.2	77.3	68.8	26.6
Total	15,547,756	3,491,579	3,670,352	20,797,504	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
VEGETABLE MATTER—con.								
Oil cake and oil-cake meal:								
Cottonseed—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Belgium	30,009,935			7,824,573	3.2			1.2
Denmark	335,176,189	4,704,000		200,605,481	35.9	10.5		31.9
Germany	316,183,442				33.9			
Netherlands	55,879,799			1,826,445	6.0			.3
Norway	28,019,121			35,412,218	3.0			5.6
United Kingdom	146,111,558	19,751,335	691,800	249,540,669	15.7	44.2	5.9	39.7
Other countries	21,908,452	20,225,458	10,975,496	132,923,780	2.3	45.3	94.1	21.3
Total	933,288,496	44,680,793	11,667,296	628,133,166	100.0	100.0	100.0	100.0
Linseed or flaxseed—								
Belgium	288,955,020			80,622,811	43.7			22.8
France	34,587,191			263,503	5.2			.1
Netherlands	280,782,728	448,656		104,614,268	42.4	.3		29.6
United Kingdom	42,781,016	98,785,060	15,422,381	84,678,808	6.5	65.2	17.9	23.9
Other countries	14,712,925	52,166,261	70,532,001	83,572,093	2.2	34.5	82.1	23.6
Total	661,818,880	151,399,977	85,954,382	353,751,483	100.0	100.0	100.0	100.0
Oils, vegetable:								
Cottonseed—								
Argentina	9,300,144	1,971,552	922,335	231,314	3.4	2.0	.8	.1
Austria-Hungary	4,951,218				1.8			
Belgium	4,053,300			1,613,034	1.5			.8
Canada	20,345,315	40,859,087	48,116,625	39,662,192	7.5	40.6	40.4	20.5
Chile	4,320,237	1,912,903	1,604,155	491,621	1.6	1.9	1.3	.3
Cuba	3,522,682	11,077,844	9,805,509	5,102,662	1.3	11.0	8.2	2.6
France	14,510,409	7,021,545	800,000	7,211,541	5.3	7.0	.7	3.7
Germany	13,184,524			11,563	4.9			(1)
Italy	27,558,963		1,966,500	9,551,748	10.2		1.7	4.9
Mexico	21,994,280	229,847	651,720	495,049	8.1	.2	.5	.3
Netherlands	58,258,887			30,377,990	21.5			15.7
Norway	7,512,668	572,765		15,626,944	2.8	.6		8.1
Roumania	3,010,554			25,020	1.1			(1)
Turkey, European	9,129,051			1,274,043	3.4			.7
United Kingdom	39,832,247	27,888,581	43,034,025	37,814,421	14.7	27.7	36.1	19.6
Uruguay	3,666,681	755,270	44,730	63,450	1.4	.7	(1)	(1)
Other countries	26,277,418	8,490,587	12,121,777	43,580,609	9.5	8.3	10.3	22.7
Total	271,428,578	100,779,981	119,067,376	193,133,201	100.0	100.0	100.0	100.0
Tobacco, leaf, stem, and trimmings:								
Belgium	11,722,421	75,523		51,031,229	3.0	(1)		6.6
British Africa	6,233,693	8,611,717	8,567,544	14,287,892	1.6	3.0	2.1	1.8
British Oceania	13,984,064	6,786,008	11,393,314	12,996,852	3.6	2.3	2.8	1.7
Canada	15,149,901	17,577,987	26,409,427	19,855,703	3.9	6.1	6.5	2.6
China	7,061,404	7,959,312	14,581,263	14,558,402	1.8	2.8	3.6	1.9
France	42,503,455	73,372,601	65,497,745	81,739,541	10.8	25.4	16.1	10.5
French Africa	4,167,210	2,511,968	2,950,749	8,914,872	1.1	.9	.7	1.1
Germany	37,803,645			4,893,832	9.6			.6
Italy	41,706,176	38,540,529	50,357,819	43,623,888	10.6	13.3	12.4	5.6
Japan	2,997,113	2,346,479	3,723,740	4,230,513	.8	.8	.9	.5
Netherlands	26,971,486	1,359,367		68,584,267	6.9	.5		8.8
Spain	20,111,895	17,890,064	11,449,293	24,291,993	5.1	6.2	2.8	3.1
United Kingdom	139,862,251	89,453,467	183,555,420	338,872,440	35.7	30.9	45.1	43.6
Other countries	21,908,357	22,685,666	28,340,464	88,796,711	5.5	7.8	7.0	11.6
Total	392,183,071	289,170,686	406,826,718	776,678,135	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
FOREST PRODUCTS.								
Naval stores:								
Rosin—	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Argentina	110,085	149,536	68,632	116,708	4.6	14.0	8.8	9.6
Austria-Hungary	76,883	...	...	2,989	3.2	...	...	.2
Belgium	140,413	...	...	14,623	5.8	...	...	1.2
Brazil	155,226	158,824	97,750	154,513	6.5	14.8	12.5	12.8
Canada	80,882	129,070	140,588	71,316	3.4	12.1	18.0	5.9
Germany	727,521	...	...	98	30.2	...	...	...
Italy	98,964	10,056	26	18,470	4.1	1.0	(1)	1.5
Netherlands	208,598	...	...	24,554	8.7	...	...	2.0
Russia, European	104,657	...	...	45	4.3	...	...	...
United Kingdom	501,572	274,976	191,038	504,489	20.8	25.7	24.5	41.7
Other countries	201,675	348,467	280,993	301,822	8.4	32.4	36.2	25.1
Total	2,406,476	1,070,929	779,027	1,209,627	100.0	100.0	100.0	100.0
Turpentine, spirits of—	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*				
Argentina	524,265	321,797	183,702	528,391	2.9	6.3	4.9	5.0
Belgium	1,748,419	...	...	304,811	9.7	...	...	2.9
British Oceania	639,300	942,751	800,361	137,611	3.6	18.5	21.5	1.3
Canada	1,027,501	978,125	1,134,122	969,776	5.7	19.2	30.5	9.1
Germany	2,868,253	...	...	10,716	15.9	...	...	.1
Netherlands	3,166,749	...	...	673,653	17.6	...	...	6.3
United Kingdom	6,774,171	1,413,732	294,076	6,220,048	37.7	27.7	7.9	58.3
Other countries	1,240,348	1,438,719	1,304,832	1,827,096	6.9	28.3	35.2	17.0
Total	17,989,006	5,095,124	3,717,093	10,672,102	100.0	100.0	100.0	100.0
Lumber:								
Fir—	*M feet.*	*M feet.*	*M feet.*	*M feet.*				
Australia		63,865	54,958	37,650		23.3	20.2	12.5
Canada		20,562	16,557	27,846		7.5	6.1	9.2
Chile		45,416	28,488	6,068		16.6	10.5	2.0
China		8,121	13,479	49,514		3.0	4.9	16.5
Japan		29,044	30,926	27,810		10.6	11.4	9.2
Mexico	(2)	8,091	6,880	7,879	(2)	3.0	2.5	2.6
New Zealand		3,283	4,153	3,873		1.2	1.5	1.3
Panama		4,769	2,980	18,231		1.7	1.1	6.1
Peru		51,053	50,830	33,358		18.6	18.7	11.1
United Kingdom		13,646	21,341	40,522		5.0	8.9	13.5
Other countries		26,413	38,809	48,363		9.5	14.2	16.0
Total	(2)	274,263	272,401	301,114	(2)	100.0	100.0	100.0
Oak—								
Argentina		3,414	2,779	13,105		5.1	4.3	8.3
Canada		47,183	44,021	42,799		70.2	68.1	27.1
France	(2)	474	793	2,520	(2)	.7	1.2	1.6
United Kingdom		9,753	8,791	70,915		14.5	13.6	44.9
Other countries		6,362	8,279	28,598		9.5	12.8	18.1
Total	(2)	67,216	64,663	157,937	(2)	100.0	100.0	100.0
Pine, yellow, longleaf—								
Argentina		33,317	17,902	73,978		9.6	6.0	16.9
Brazil		2,050	920	1,021		.6	.3	.2
Canada		2,170	1,815	1,106		.6	.6	.3
Cuba		192,690	168,753	154,843		55.7	56.3	35.4
France		8,635	167	9,408		2.5	.1	2.1
Italy		1,293	2,670	2,621		.4	.9	.6
Mexico	(2)	35,346	30,298	34,896	(2)	10.2	10.1	8.0
Panama		11,884	12,442	7,369		3.4	4.1	1.7
Spain		2,792	339	7,797		.8	.1	1.8
United Kingdom		10,220	18,365	66,108		3.0	6.1	15.1
Uruguay		3,961	2,019	16,394		1.1	.7	3.7
Other countries		41,759	44,202	62,229		12.1	14.7	14.2
Total	(2)	346,117	299,922	437,773	(2)	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

[2] Not separately stated.

TABLE 295.—*Destination of principal farm products exported from the United States, 1910–1919*—Continued.

Article, and country to which consigned.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
FOREST PRODUCTS—con.								
Railroad ties:	*Number.*	*Number.*	*Number.*	*Number.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Canada	(1)	1,487,415	1,580,127	1,573,937	(1)	43.3	58.9	33.5
Cuba		804,718	471,713	319,224		23.4	17.6	6.8
France		97,187	29,953	62,543		2.8	1.1	1.3
Honduras		70,379	42,216	54,463		2.0	1.6	1.2
Mexico		611,698	317,332	476,970		17.8	11.8	10.1
United Kingdom		18,069	19,435	2,001,994		.5	.7	42.6
Other countries		345,831	221,047	210,771		10.2	8.3	4.5
Total	(1)	3,435,297	2,681,823	4,699,902	(1)	100.0	100.0	100.0
Timber, sawed:								
Pitch pine, long leaf—	*M feet.*	*M feet.*	*M feet.*	*M feet.*				
Canada	(1)	1,830	532	393	(1)	2.8	1.5	.3
France		2,020	192	8,433		3.1	.5	5.5
Italy		983	....	17,551		1.5	......	11.4
United Kingdom		32,750	19,928	100,133		50.2	55.5	64.9
Other countries		27,650	15,240	27,676		24.4	42.5	17.9
Total	(1)	65,233	35,892	154,186	(1)	100.0	100.0	100.0

[1] Not separately stated.

TABLE 296.—*Origin of principal farm products imported into the United States, 1910–1919.*

Article and country of origin.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average, 1910–1914.	1918	1918	1919	Average, 1910–1914.	1918	1918	1919
ANIMAL MATTER.								
Cattle:	*Number.*	*Number.*	*Number.*	*Number.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Canada	56,097	185,089	249,316	550,004	14.1	63.0	70.7	85.6
Mexico	339,616	105,470	100,632	90,541	85.4	35.9	28.5	14.1
Other countries	1,737	3,160	2,653	1,850	.5	1.1	.8	.3
Total	397,450	293,719	352,601	642,395	100.0	100.0	100.0	100.0
Horses:								
Canada	3,199	3,736	3,386	4,495	22.6	73.2	87.5	90.0
France	1,933	263	211	11	13.6	5.1	5.5	.2
Mexico	6,846	795	141	412	48.3	15.5	3.6	8.2
Other countries	2,191	317	131	76	15.5	6.2	3.4	1.6
Total	14,169	5,111	3,869	4,994	100.0	100.0	100.0	100.0
Dairy products:								
Cheese, including substitutes—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
Argentina	....	8,252,446	6,589,121	5,043,010	......	83.9	87.1	44.5
France	4,142,716	1,026,117	542,010	680,867	8.4	10.4	7.1	6.0
Italy	20,834,962	16,044	5,044	373,807	42.3	.2	.1	3.3
Netherlands	3,365,038	....	....	4,947	6.8	......	......	(1)
Switzerland	16,924,388	....	....	12,354	34.4	......	......	.1
Other countries	3,953,013	544,698	425,869	5,217,219	8.1	5.5	5.7	46.1
Total	49,220,117	9,893,305	7,562,044	11,332,204	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

TABLE 296.—*Origin of principal arm products imported into the United States, 1910–1919*—Continued.

Article and country of origin.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average, 1910–1914.	1918	1918	1919
ANIMAL MATTER—contd.								
Fibers, animal:								
Silk, raw—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
China	5,133,658	6,180,480	5,750,902	9,099,492	21.6	17.7	17.5	20.3
Italy	2,605,466	7,309	5,503	1,865,807	10.9	(1)	(1)	4.2
Japan	15,591,700	28,645,529	27,074,811	33,726,581	65.5	82.2	82.4	75.3
Other countries	468,574	12,879	34,237	125,038	2.0	.1	.1	.2
Total	23,799,398	34,846,197	32,865,453	44,816,918	100.0	100.0	100.0	100.0
Wool, class 1—								
Argentina	22,406,577	161,981,865	203,238,338	118,854,446	27.0	53.3	54.4	35.6
Australia Commonwealth	17,221,074	29,956,449	65,117,777	46,034,615	20.7	9.9	17.4	13.8
Belgium	1,442,467	....	....	204,210	1.7	......	......	.1
British South Africa	140,462	55,757,397	51,063,594	51,466,180	.1	18.3	13.7	15.4
Chile	122,918	12,069,231	10,886,730	11,959,417	(1)	4.0	2.9	3.6
China	21,820	13,226,755	10,505,636	8,528,802	(1)	4.3	2.8	2.6
New Zealand	4,452,965	4,117,146	6,276,375	14,234,386	5.4	1.3	1.7	4.3
United Kingdom	31,159,170	161,498	38,675	14,704,025	37.5	.1	(1)	4.4
Uruguay	4,204,432	17,785,170	17,655,598	49,931,366	5.1	5.9	4.7	14.9
Other countries	1,873,841	8,813,429	9,128,152	18,182,091	2.5	2.9	2.4	5.3
Total	83,045,726	303,868,940	373,910,875	334,099,538	100.0	100.0	100.0	100.0
Wool, class 2—								
Argentina	933,432	3,838,542	2,357,025	2,087,101	5.0	27.5	22.4	14.0
Canada	1,619,390	8,419,647	709,549	650,924	8.5	60.3	6.7	4.4
United Kingdom	14,328,023	....	60,280	3,382,806	75.1	......	.6	22.8
Other countries	2,190,057	1,695,768	7,397,785	8,724,141	11.4	12.2	70.3	58.8
Total	19,070,902	13,953,957	10,524,639	14,844,972	100.0	100.0	100.0	100.0
Wool, class 3—								
Argentina	3,834,849	15,258,176	15,068,215	14,045,112	3.7	25.9	21.7	14.5
British East Indies	3,924,193	41,309	9,575	66,218	3.7	.1	(1)	.1
British South Africa	165,941	4,521,876	4,442,103	2,386,257	.1	7.6	6.4	2.5
Chile	51,960	5,231,980	8,196,911	13,274,457	(1)	8.9	11.8	13.7
China	32,806,474	24,432,434	31,198,498	29,813,744	31.2	41.4	45.0	30.8
Russia (Asiatic and European)	21,015,422	2,699,379	2,739,987	1,539,889	20.0	4.6	4.0	1.6
Turkey (Asiatic)	6,939,783	....	....	1,353,398	6.6	......	......	1.4
United Kingdom	23,114,951	138,367	....	19,044,860	22.0	.2	......	19.6
Other countries	13,270,122	6,671,141	7,636,569	15,424,389	12.7	11.3	11.1	15.8
Total	105,123,695	58,994,662	69,291,858	96,948,324	100.0	100.0	100.0	100.0
Packing-house products:								
Hides and skins other than furs—								
Calfskins—								
Argentina	2,929,755	2,074,781	436,134	4,467,257	3.5	15.8	5.8	6.9
Belgium	4,238,167	....	....	721,686	5.1	......	......	1.1
Canada	6,267,359	2,382,544	1,031,069	5,280,116	7.5	18.1	13.6	8.2
Denmark	4,182,108	....	....	4,086,657	5.0	......	......	6.3
East Indies	2,132,857	3,442,034	1,452,942	24,045,701	2.6	26.2	19.2	37.2
France	4,874,163	70,236	30,947	4,590,533	5.8	.5	.4	7.1
Germany	16,567,590	....	....	....	19.8	......	......	......
Netherlands	7,839,510	492,427	863,679	7,737,059	9.4	3.7	11.4	12.0
Norway	1,787,301	1,052,485	....	2,012,338	2.2	8.0	......	3.1
Russia (European)	22,419,150	663,341	....	....	26.8	5.0	......	......
United Kingdom	4,501,812	234,854	12,643	1,664,878	5.4	1.8	.2	2.6
Other countries	5,778,631	2,748,613	3,755,309	9,949,296	6.9	20.9	49.4	15.5
Total	83,518,403	13,161,315	7,582,723	64,555,521	100.0	100.0	100.0	100.0
Cattle hides—								
Argentina	71,324,202	103,468,863	89,072,009	146,103,225	28.1	38.7	40.3	35.9
Belgium	9,238,890	....	....	174,056	3.6	......	......	(1)
Brazil	1,745,003	19,213,317	12,748,697	29,517,585	.7	7.2	5.8	7.2

[1] Less than 0.05 of 1 per cent.

TABLE 296.—*Origin of principal farm products imported into the United States, 1910–1919*—Continued.

Article and country of origin.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average, 1910–1914.	1918	1918	1919	Average, 1910–1914.	1918	1918	1919
ANIMAL MATTER—contd.								
Packing-house products—Continued.								
Hides and skins, other than furs—Contd.								
Cattle hides—Contd.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Canada	35, 445, 887	29, 353, 473	19, 253, 175	43, 062, 218	14.0	11.0	8.7	10.6
China	4, 957, 534	12, 451, 439	5, 124, 640	7, 748, 834	2.0	4.6	2.3	1.9
Colombia	5, 634, 740	13, 837, 098	7, 522, 824	14, 979, 377	2.2	5.2	3.4	3.7
Cuba	4, 516, 358	12, 065, 247	10, 985, 264	12, 500, 062	1.8	4.5	5.0	3.1
East Indies	4, 965, 027	2, 286, 286	1, 522, 893	14, 350, 871	2.0	.9	.7	3.5
France	17, 583, 731	54, 379	......	7, 701, 942	6.9	(1)	......	1.9
Germany	8, 288, 419	......	......	......	3.3	......	......	......
Italy	3, 452, 654	......	......	93, 351	1.4	......	......	(1)
Mexico	29, 277, 132	23, 851, 700	22, 976, 876	26, 288, 312	11.6	8.9	10.4	6.5
Netherlands	6, 142, 184	623, 220	37, 258	4, 031, 983	2.4	.2	(1)	1.0
Russia (European)	9, 492, 894	......	......	......	3.7	......	......	......
United Kingdom	9, 167, 276	205, 830	27, 459	5, 370, 120	3.6	.1	(1)	1.3
Uruguay	12, 911, 444	25, 693, 227	35, 541, 069	48, 294, 455	5.1	9.6	16.1	11.9
Venezuela	5, 065, 636	4, 772, 413	2, 753, 236	7, 922, 391	2.0	1.8	1.2	1.9
Other countries	14, 220, 934	19, 623, 278	13, 485, 670	39, 143, 489	5.6	7.3	6.1	9.6
Total	253, 429, 945	267, 499, 770	221, 051, 070	407, 282, 271	100.0	100.0	100.0	100.0
Goat skins—								
Aden	3, 656, 513	2, 031, 272	866, 760	6, 726, 235	3.8	3.0	1.4	5.0
Africa, n. e. s.	1, 530, 418	777, 700	31, 172	1, 012, 052	1.6	1.2	.1	.8
Argentina	3, 944, 343	2, 739, 243	2, 326, 191	7, 474, 336	4.1	4.1	3.7	5.6
Brazil	3, 621, 530	3, 324, 871	2, 906, 400	6, 606, 837	3.8	5.0	4.7	4.9
British Africa	2, 241, 731	3, 523, 177	3, 190, 091	7, 931, 326	2.3	5.3	5.1	5.9
China	9, 394, 904	12, 105, 273	13, 811, 654	15, 217, 301	9.8	18.1	22.1	11.4
East Indies	41, 905, 364	33, 493, 842	32, 446, 710	62, 772, 369	43.7	50.0	52.0	47.0
France	2, 543, 276	190, 967	12, 630	1, 848, 224	2.7	.3	(1)	1.4
Mexico	5, 534, 421	2, 629, 706	2, 889, 599	3, 315, 986	5.8	3.9	4.6	2.5
Russia (European)	5, 425, 651	......	......	......	5.7	......	......	......
United Kingdom	5, 180, 243	352, 567	227, 539	4, 432, 373	5.4	.5	.4	3.3
Venezuela	1, 561, 559	1, 266, 543	752, 546	2, 813, 980	1.6	1.9	1.2	2.1
Other countries	9, 281, 854	4, 497, 776	2, 902, 257	13, 505, 795	9.7	6.7	4.7	10.1
Total	95, 821, 807	66, 932, 937	62, 363, 549	133, 656, 814	100.0	100.0	100.0	100.0
Sheepskins:								
Aden	779, 218	909, 940	622, 691	2, 494, 391	1.2	1.7	1.2	2.9
Argentina	5, 270, 655	14, 644, 079	9, 087, 101	15, 674, 103	8.1	26.4	17.3	18.4
Brazil	1, 244, 866	1, 346, 169	985, 249	3, 175, 161	1.9	2.4	1.9	3.7
British India	2, 887, 204	2, 490, 592	2, 789, 044	4, 694, 998	4.4	4.5	5.3	5.5
British Oceania	7, 716, 554	10, 364, 512	25, 000, 044	16, 933, 622	11.9	18.7	47.7	19.9
British South Africa	1, 408, 522	9, 725, 641	5, 937, 809	7, 415, 027	2.2	17.5	11.3	8.7
Canada	2, 109, 858	1, 819, 375	798, 873	5, 341, 467	3.2	3.3	1.5	6.3
China	712, 493	1, 983, 559	1, 521, 008	2, 072, 754	1.1	3.6	2.9	2.4
France	2, 637, 365	413, 334	248, 610	370, 094	4.1	.7	.5	.4
Russia (European)	6, 334, 259	......	......	76, 423	9.7	......	......	.1
United Kingdom	28, 434, 981	3, 543, 102	373, 505	9, 971, 075	43.7	6.4	.7	11.7
Uruguay	243, 322	1, 564, 089	570, 778	2, 491, 237	.4	2.8	1.1	2.9
Other countries	5, 297, 708	6, 664, 523	4, 529, 639	14, 321, 467	8.1	12.0	8.6	17.1
Total	65, 077, 005	55, 468, 915	52, 464, 351	85, 031, 819	100.0	100.0	100.0	100.0
VEGETABLE MATTER.								
Cocoa, crude:								
Brazil	17, 128, 176	91, 351, 529	66, 007, 884	69, 990, 057	12.1	22.9	18.3	17.9
British West Africa	9, 288	99, 397, 070	93, 473, 106	158, 713, 898	(1)	24.9	26.0	40.6
British West Indies	36, 119, 338	51, 438, 970	51, 535, 501	30, 199, 700	25.5	12.9	14.3	7.7
Dominican Republic	24, 818, 840	39, 851, 184	38, 099, 255	44, 665, 321	17.5	10.0	10.6	11.4
Ecuador	19, 120, 725	76, 786, 657	68, 920, 773	46, 404, 529	13.5	19.2	19.1	11.9
Portugal	18, 751, 436	134, 904	......	1, 087, 271	13.2	(1)	......	.3
United Kingdom	8, 534, 723	1, 038, 142	478, 421	7, 257, 064	6.0	.3	.1	1.9
Venezuela	4, 719, 067	20, 829, 600	23, 318, 711	10, 726, 250	3.3	5.2	6.5	2.7
Other countries	12, 598, 842	18, 212, 345	18, 126, 110	22, 353, 219	8.9	4.6	5.1	5.6
Total	141, 800, 435	399, 040, 401	359, 959, 761	391, 397, 309	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

TABLE 296.—*Origin of principal farm products imported into the United States, 1910–1919*—Continued.

Article and country of origin.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average, 1910–1914.	1918	1918	1919	Average, 1910–1914.	1918	1918	1919
VEGETABLE MATTER—continued.								
Coffee:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Brazil	673, 058, 602	743, 958, 456	599, 991, 374	787, 312, 293	74. 8	65. 0	5. 0	59. 0
Central American States and British Honduras	38, 789, 033	166, 292, 751	195, 259, 324	131, 638, 695	4. 3	14. 5	18. 6	9. 9
Colombia	70, 516, 164	112, 159, 390	118, 909, 462	150, 483, 853	7. 8	9. 8	11. 3	11. 3
East Indies	9, 893, 785	4, 773, 288	4, 756, 528	56, 919, 126	1. 1	. 4	. 5	4. 3
Mexico	31, 220, 334	31, 118, 513	19, 849, 230	29, 567, 469	3. 5	2. 7	1. 9	2. 2
Netherlands	2, 565, 776			1, 335	. 3			(1)
Venezuela	45, 806, 538	50, 122, 484	53, 654, 080	109, 777, 831	5. 1	4. 4	5. 1	8. 2
West Indies and Bermuda	5, 614, 876	30, 240, 917	53, 459, 694	42, 013, 841	. 6	2. 6	5. 1	3. 2
Other countries	21, 874, 219	5, 225, 090	6, 321, 809	25, 849, 624	2. 5	. 6	. 5	1. 9
Total	899, 339, 327	1,143,890,889	1,052,201,501	1,333,564,067	100. 0	100. 0	100. 0	100. 0
Fibers, vegetable:								
Cotton—								
Egypt	77, 876, 828	47, 532, 526	63, 521, 653	86, 485, 327	70. 2	46. 0	56. 4	49. 3
Peru	5, 544, 333	9, 417, 672	4, 403, 303	20, 213, 172	5. 0	9. 1	3. 9	11. 5
United Kingdom	7, 687, 013	14		18, 545, 720	6. 9	(1)		10. 6
British India	2, 533, 063	3, 147, 235	1, 665, 279	4, 927, 097	2. 3	3. 0	1. 5	2. 8
Mexico	7, 761, 757	17, 862, 209	22, 993, 541	30, 890, 061	7. 0	17. 3	20. 4	17. 6
Other countries	9, 554, 004	25, 365, 991	20, 100, 316	14, 296, 991	8. 6	24. 6	17. 8	8. 2
Total	110, 956, 998	103, 325, 647	112, 684, 092	175, 358, 368	100. 0	100. 0	100. 0	100. 0
Flax—	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*				
Belgium	2, 100			18	19. 5			. 4
Canada	550	762	4, 583	1, 370	5. 1	13. 6	58. 3	31. 0
Russia (European)	2, 862	2, 955	2, 502	21	26. 6	52. 7	31. 8	. 5
United Kingdom	4, 308	1, 129	304	1, 510	40. 1	20. 1	3. 9	34. 2
Other countries	932	761	467	1, 501	8. 7	13. 6	6. 0	33. 9
Total	10, 752	5, 607	7, 856	4, 420	100. 0	100. 0	100. 0	10. 0
Jute and jute butts—								
British East Indies	89, 320	77, 573	71, 309	61, 966	95. 9	99. 1	99. 9	99. 4
Other countries	3, 843	739	105	366	4. 1	. 9	. 1	. 6
Total	93, 163	78, 312	71, 414	62, 332	100. 0	100. 0	100. 0	100. 0
Manila fiber—								
Philippine Islands	70, 513	86, 065	78, 305	68, 044	98. 0	99. 8	99. 4	99. 3
Other countries	1, 409	155	478	492	2. 0	. 2	. 6	. 7
Total	71, 922	86, 220	78, 783	68, 536	100. 0	100. 0	100. 0	100. 0
Sisal grass—								
Mexico	128, 314	137, 343	139, 351	133, 591	91. 4	91. 5	91. 8	92. 4
Other countries	12, 001	12, 821	12, 525	10, 951	8. 6	8. 5	8. 2	7. 6
Total	140, 315	150, 164	151, 876	144, 542	100. 0	100. 0	100. 0	100. 0
Fruit:								
Bananas—	*Bunches.*	*Bunches.*	*Bunches.*	*Bunches.*				
British West Indies	14, 404, 120	2, 064, 274	3, 033, 262	6, 912, 779	33. 0	6. 0	9. 4	18. 7
Central American States and British Honduras	23, 010, 323	25, 895, 734	23, 470, 560	24, 293, 461	52. 7	75. 0	72. 8	65. 7
Cuba	2, 388, 024	1, 151, 165	972, 426	1, 515, 832	5. 5	3. 3	3. 0	4. 1
South America	2, 344, 511	5, 214, 500	4, 652, 004	4, 094, 940	5. 4	15. 1	14. 4	11. 1
Other countries	1, 536, 446	224, 240	120, 776	176, 083	3. 4	. 6	. 4	. 4
Total	43, 683, 424	34, 549, 913	32, 249, 028	36, 993, 095	100. 0	100. 0	100. 0	100. 0

[1] Less than 0.05 of 1 per cent.

TABLE 296.—*Origin of principal farm products imported into the United States, 1910–1919*—Continued.

Article and country of origin.	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
VEGETABLE MATTER—con.								
Nuts:								
Walnuts—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Austria-Hungary	842, 698	....	....	....	2. 5	......	......	......
China	2, 155, 291	2, 084, 108	1, 891, 243	7, 080, 192	6. 4	8. 9	14. 5	22. 5
France	21, 026, 019	9, 099, 952	6, 552, 094	8, 519, 292	62. 5	39. 1	50. 4	27. 0
Italy	5, 754, 825	3, 260, 317	909, 196	6, 360, 433	17. 1	26. 9	7. 0	20. 2
Turkey (Asiatic)	1, 249, 497	....	....	....	3. 7	......	......	......
Other countries	2, 638, 219	5, 844, 793	3, 658, 871	9, 536, 060	7. 8	25. 1	28. 1	30. 3
Total	33, 666, 549	23, 289, 170	13, 011, 404	31, 495, 977	100. 0	100. 0	100. 0	100. 0
Oils, vegetable:								
Olive, edible—	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*				
France	864, 796	227, 617	88, 088	183, 124	17. 7	9. 0	51. 5	2. 0
Italy	3, 293, 220	200, 403	5, 729	251, 902	67. 5	7. 9	3. 3	2. 8
Spain	292, 434	2, 091, 400	65, 895	8, 557, 416	6. 0	82. 4	38. 5	94. 8
Other countries	426, 173	18, 092	11, 449	31, 694	8. 8	. 7	6. 7	. 4
Total	4, 876, 623	2, 537, 512	171, 161	9, 024, 136	100. 0	100. 0	100. 0	100. 0
Soya bean oil—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
China	[2] 1, 327, 548	12, 470, 720	13, 538, 334	11, 230, 292	7. 0	3. 7	4. 0	5. 7
Japanese-China	[2] 2, 195, 714	237, 442, 917	230, 839, 925	99, 042, 642	[2] 11. 6	70. 5	68. 7	50. 6
Japan	[2] 9, 253, 941	86, 830, 583	91, 605, 233	84, 218, 232	[2] 48. 9	25. 8	27. 3	43. 0
United Kingdom	[2] 4, 617, 154	....	....	....	[2] 24. 4	......	......	......
Other countries	[2] 1, 512, 949	80, 426	656	1, 317, 255	[2] 8. 1	(1)	(1)	. 7
Total	[2] 18, 907, 306	336, 824, 646	335, 984, 148	195, 808, 421	100. 0	100. 0	100. 0	100. 0
Opium:								
Turkey (Asiatic and European)	380, 536	....	....	641, 187	77. 9	......	......	87. 8
United Kingdom	68, 587	126, 173	121, 324	40, 207	14. 0	79. 9	76. 0	5. 5
Other countries	39, 387	31, 661	38, 297	48, 878	8. 1	20. 1	24. 0	6. 7
Total	488, 510	157, 834	159, 621	730, 272	100. 0	100. 0	100. 0	100. 0
Seeds:								
Flaxseed or linseed—	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*				
Argentina	1, 974, 021	7, 432, 421	9, 668, 119	12, 353, 932	27. 2	55. 6	74. 5	88. 0
Belgium	147, 273	....	....	....	2. 0	......	......	......
British India	836, 366	....	11, 088	....	11. 5	......	. 1	......
Canada	4, 110, 370	5, 501, 391	3, 240, 043	1, 279, 132	56. 6	41. 2	25. 0	9. 1
United Kingdom	178, 859	....	21	....	2. 5	......	(1)	......
Other countries	11, 323	432, 717	55, 205	403, 120	. 2	3. 2	. 4	2. 9
Total	7, 258, 212	13, 366, 529	12, 974, 476	14, 036, 184	100. 0	100. 0	100. 0	100. 0
Grass seed—								
Clover—	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*				
Canada	5, 128, 518	4, 697, 881	7, 209, 330	10, 870, 385	20. 0	58. 9	75. 7	43. 4
France	7, 979, 405	1, 317, 004	631, 911	8, 530, 878	31. 1	16. 5	6. 6	34. 1
Germany	6, 556, 388	....	....	27, 517	25. 5	......	......	. 1
Italy	2, 297, 896	1, 285, 064	1, 328, 715	4, 639, 318	9. 0	16. 1	14. 0	18. 5
Other countries	3, 699, 993	678, 146	350, 010	973, 900	14. 4	8. 5	3. 7	3. 9
Total	25, 662, 200	7, 978, 095	9, 519, 966	25, 041, 998	100. 0	100. 0	100. 0	100. 0
Sugar, raw cane:								
Cuba	3,856,447,356	4,560,749,643	4,953,689,419	6,686,141,983	88. 8	93. 1	95. 9	95. 2
Dominican Republic	10, 302, 955	14, 395, 335	4, 831, 020	7, 989, 541	. 2	. 3	. 1	. 1
Dutch East Indies	179, 217, 222	....	3, 272	30, 963, 112	4. 1	......	(1)	. 4
Philippine Islands	232, 340, 306	173, 600, 941	135, 602, 975	175, 872, 529	5. 4	3. 5	2. 6	2. 5
South America	39, 733, 149	75, 980, 455	29, 429, 746	35, 040, 367	. 9	1. 6	. 6	. 5
Other countries	23, 016, 602	73, 550, 651	43, 284, 440	83, 682, 943	. 6	1. 5	. 8	1. 3
Total	4,341,057,590	4,898,277,025	5,166,840,872	7,019,690,475	100. 0	100. 0	100. 0	100. 0

[1] Less than 0.05 of 1 per cent.

[2] Average 3 years only, 1912–1914.

TABLE 296.—*Origin of principal farm products imported into the United States, 1910–1919*—Continued.

Article and country of origin	Quantity.				Per cent of total.			
	Year ending June 30—		Year ending Dec. 31—		Year ending June 30—		Year ending Dec. 31—	
	Average 1910–1914.	1918	1918	1919	Average 1910–1914.	1918	1918	1919
VEGETABLE MATTER—con.								
Tea:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Canada	2,787,373	1,914,169	2,294,155	2,257,012	2.9	1.3	1.7	2.8
China	22,932,930	21,082,866	14,202,680	10,557,985	24.1	13.9	10.6	13.0
East Indies	10,500,188	74,164,326	60,364,828	26,987,615	11.0	49.0	44.9	33.3
Japan	46,245,473	52,996,471	56,436,650	39,959,916	48.6	35.0	42.0	49.4
United Kingdom	11,620,183	487,063	381,799	534,647	12.2	.3	.3	.7
Other countries	1,040,002	670,037	738,089	665,745	1.2	.5	.5	.8
Total	95,126,149	151,314,932	134,418,201	80,962,920	100.0	100.0	100.0	100.0
Tobacco leaf:								
Wrapper—								
Dutch East Indies	46	3,890,236	6,984,516	6,504,615	(1)	86.2	95.5	90.9
Netherlands	6,087,084	353,172	1,315	109,723	96.4	7.8	(1)	1.5
Other countries	227,105	271,936	327,269	539,804	3.6	6.0	4.5	7.6
Total	6,314,235	4,515,344	7,313,100	7,154,142	100.0	100.0	100.0	100.0
Other leaf—								
Cuba	25,147,491	20,366,787	20,490,954	21,969,643	52.0	27.2	26.9	28.1
Dominican Republic	26,285	15,242,017	19,138,463	6,433,478	.1	20.4	25.1	8.2
Germany	1,410,469				2.9			
Greece	1,079,079	18,626,083	17,496,045	20,702,622	2.2	24.9	23.0	26.5
Turkey (Asiatic)	11,564,036		23,880	11,878,239	23.9		(1)	15.2
Turkey (European)	8,110,601			3,094,792	16.8			4.0
Other countries	1,042,024	20,617,332	19,051,673	14,131,362	2.1	27.5	25.0	18.0
Total	48,379,985	74,852,219	76,201,015	78,210,136	100.0	100.0	100.0	100.0
FOREST PRODUCTS.								
India rubber, crude:								
Belgium	6,262,187				5.9			
Brazil	40,290,919	41,277,914	40,332,620	58,845,384	38.1	10.6	12.4	11.0
Canada	92,028	4,247,287	2,712,336	5,320,540	.1	1.1	.8	1.0
Central American States and British Honduras	1,142,524	736,014	387,144	448,827	1.1	.2	.1	.1
East Indies	8,447,379	311,909,581	265,040,618	390,884,566	8.0	80.1	81.3	72.9
France	3,320,383	508,017	169,318	2,410,319	3.1	.1	.1	.4
Germany	7,266,443				6.9			
Mexico	5,848,310	1,033,087	2,185,809	963,242	5.5	.3	.7	.2
Other South America	2,395,691	6,747,699	3,590,744	6,965,752	2.3	1.7	1.1	1.3
Portugal	1,325,719	538,076	424,424	87,422	1.3	.1	.1	
United Kingdom	28,736,758	21,926,945	6,627,165	60,251,894	27.2	5.6	2.0	11.2
Other Countries	607,902	674,395	4,489,130	9,762,475	.5	.2	1.4	1.9
Total	105,736,243	389,599,015	325,959,308	535,940,421	100.0	100.0	100.0	100.0
Wood:								
Cabinet wood—								
Mahogany—	*M. feet.*	*M. feet.*	*M. feet.*	*M. feet.*				
British Africa	6,197	7,667	6,353	13,849	11.5	14.8	14.4	32.4
Central American States and British Honduras	14,237	27,098	22,971	18,556	26.5	52.4	52.1	43.5
Mexico	11,204	11,230	10,711	5,610	20.9	21.7	24.3	13.1
United Kingdom	15,050	78	77	656	28.0	.2	.2	1.5
Other countries	6,996	5,608	3,986	4,007	13.1	10.9	9.0	9.5
Total	53,684	51,681	44,098	42,678	100.0	100.0	100.0	100.0
Boards, planks, deals, and other sawed lumber—								
Canada	937,069	1,253,507	1,183,015	1,119,244	96.5	97.7	98.1	97.8
Other countries	33,955	29,194	23,012	24,943	3.5	2.3	1.9	2.2
Total	971,024	1,282,701	1,206,027	1,144,187	100.0	100.0	100.0	100.0
Wood pulp:	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*				
Canada	218,423	440,859	508,081	461,392	46.3	87.5	98.4	81.2
Germany	68,133				14.4			
Norway	72,899	10,573	5,134	11,168	15.5	2.1	1.0	2.0
Sweden	93,584	41,791	700	76,410	19.8	8.3	.1	13.5
Other countries	18,756	10,929	2,343	18,902	4.0	2.1	.5	3.3
Total	471,795	504,152	516,258	567,872	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

MISCELLANEOUS AGRICULTURAL STATISTICS.

CROP SUMMARY.

The December estimates of the Crop Reporting Board of the Bureau of Crop Estimates of the acreage, production, and value (based on prices paid to farmers on Dec. 1) of important farm crops of the United States in 1920 and 1919, with the average for the five years 1914–1918, based on the reports of the correspondents and agents of the Bureau, are as follows (1919 figures revised):

TABLE 295.—*Crop summary, 1920, 1919, and average 1914–1918.*

Crop.	Acreage.	Production.			Farm value Dec. 1.	
		Per acre.	Total.	Unit.	Per unit.	Total.
					Cents.	*Dollars.*
Corn:						
1920	104, 601, 000	30. 9	3, 232, 367, 000	Bushel	67. 7	2, 189, 721, 000
1919	100, 072, 000	28. 6	2, 858, 509, 000	...do	134. 7	3, 851, 741, 000
Average, 1914–1918	107, 225, 000	25. 7	2, 760, 484, 000	...do	94. 6	2, 612, 389, 000
Winter wheat:						
1920	37, 773, 000	15. 3	577, 763, 000	...do	149. 3	862, 341, 000
1919	49, 105, 000	14. 9	729, 503, 000	...do	210. 9	1, 538, 292, 000
Average, 1914–1918	35, 282, 000	16. 0	563, 498, 000	...do	145. 5	819, 782, 000
Spring wheat:						
1920	19, 419, 000	10. 8	209, 365, 000	...do	130. 6	273, 465, 000
1919	23, 203, 000	8. 8	204, 762, 000	...do	230. 1	471, 115, 000
Average, 1914–1918	18, 837, 000	13. 7	258, 748, 000	...do	147. 0	380, 396, 000
All wheat:						
1920	57, 192, 000	13. 8	787, 128, 000	...do	144. 3	1, 135, 806, 000
1919	72, 308, 000	12. 9	934, 265, 000	...do	215. 1	2, 009, 407, 000
Average, 1914–1918	54, 119, 000	15. 2	822, 246, 000	...do	146. 0	1, 200, 178, 000
Oats:						
1920	43, 323, 000	35. 2	1, 526, 055, 000	...do	47. 2	719, 782, 000
1919	41, 835, 000	29. 4	1, 231, 754, 000	...do	71. 5	880, 296, 000
Average, 1914–1918	41, 773, 000	33. 9	1, 414, 558, 000	...do	54. 7	773, 332, 000
Barley:						
1920	8, 083, 000	25. 0	202, 024, 000	...do	70. 7	142, 931, 000
1919	7, 198, 000	22. 4	161, 345, 000	...do	121. 0	195, 299, 000
Average, 1914–1918	8, 229, 000	26. 1	214, 819, 000	...do	80. 1	172, 084, 000
Rye:						
1920	5, 043, 000	13. 7	69, 318, 000	...do	127. 8	88, 609, 000
1919	7, 103, 000	12. 5	88, 909, 000	...do	134. 5	119, 596, 000
Average, 1914–1918	3, 918, 000	15. 3	59, 933, 000	...do	128. 2	76, 852, 000
Buckwheat:						
1920	729, 000	18. 9	13, 789, 000	...do	129. 1	17, 797, 000
1919	739, 000	20. 6	15, 244, 000	...do	146. 9	22, 397, 000
Average, 1914–1918	868, 000	17. 6	15, 305, 000	...do	119. 8	18, 331, 000
Flaxseed:						
1920	1, 785, 000	6. 2	10, 990, 000	...do	176. 6	19, 413, 000
1919	1, 572, 000	4. 9	7, 661, 000	...do	438. 3	33, 581, 000
Average, 1914–1918	1, 680, 000	7. 7	12, 922, 000	...do	232. 0	29, 984, 000
Rice:						
1920	1, 337, 000	40. 2	53, 710, 000	...do	118. 9	63, 837, 000
1919	1, 091, 800	39. 2	42, 790, 000	...do	266. 8	114, 152, 000
Average, 1914–1918	892, 920	37. 4	33, 360, 000	...do	134. 5	44, 859, 000
Potatoes:						
1920	3, 929, 000	109. 6	430, 458, 000	...do	116. 4	500, 974, 000
1919	3, 952, 000	90. 0	355, 773, 000	...do	160. 6	571, 368, 000
Average, 1914–1918	3, 938, 000	97. 0	382, 113, 000	...do	98. 1	375, 017, 000
Sweet potatoes:						
1920	1, 085, 000	103. 6	112, 368, 000	...do	112. 7	126, 629, 000
1919	1, 042, 000	101. 2	105, 405, 000	...do	133. 5	140, 706, 000
Average, 1914–1918	793, 000	94. 6	74, 983, 000	...do	96. 1	72, 039, 000
Hay, tame:						
1920	57, 915, 000	1. 57	91, 193, 000	Ton	$17. 70	1, 613, 896, 000
1919	56, 552, 000	1. 62	91, 883, 000	...do	$20. 09	1, 846, 083, 000
Average, 1914–1918	53, 386, 000	1. 53	81, 430, 000	...do	$13. 96	1, 136, 580, 000
Hay, wild:						
1920	15, 266, 000	1. 12	17, 040, 000	...do	$11. 46	195, 266, 000
1919	15, 708, 000	1. 10	17, 269, 000	...do	$16. 68	288, 087, 000
Average, 1914–1918	16, 352, 000	1. 09	17, 874, 000	...do	$9. 66	172, 587, 000
All hay:						
1920	73, 181, 000	1. 48	108, 233, 000	...do	$16. 72	1, 809, 162, 000
1919	72, 260, 000	1. 51	109, 152, 000	...do	$19. 55	2, 134, 170, 000
Average, 1914–1918	69, 738, 000	1. 42	99, 304, 000	...do	$13. 18	1, 309, 167, 000
Tobacco:						
1920	1, 894, 400	796. 1	1, 508, 064, 000	Pound	21. 1	318, 359, 000
1919	1, 910, 800	761. 3	1, 454, 725, 000	...do	39. 0	566, 709, 000
Average, 1914–1918	1, 434, 300	828. 1	1, 187, 708, 000	...do	18. 0	214, 015, 000
Cotton:						
1920	36, 383, 000	[1] 170. 8	12, 987, 000	Bale	[1] 14. 0	914, 590, 000
1919	33, 566, 000	[1] 161. 5	11, 421, 000	...do	[1] 35. 6	2, 034, 658, 000
Average, 1914–1918	34, 616, 000	[1] 171. 7	12, 424, 000	...do	[1] 18. 6	1, 106, 524, 000

[1] Pounds per acre, and cents per pound.

CROP SUMMARY—Continued.

TABLE 295.—*Crop summary, 1920, 1919, and average 1914–1918*—Continued.

Crop.	Acreage.	Production.			Farm value Dec. 1.	
		Per acre.	Total.	Unit.	Per unit.	Total.
					Cents.	*Dollars.*
Cotton seed:						
1920			5,778,000	Ton	$22.23	128,455,000
1919			5,074,000	...do	$67.14	340,653,000
Average, 1914–1918			5,538,000	...do	$44.74	247,792,000
Clover seed:						
1920	966,000	1.8	1,760,000	Bushel	$11.66	20,528,000
1919	843,000	1.6	1,341,000	...do	$26.50	35,541,000
Sugar beets:						
1920	882,000	9.69	8,545,000	Ton	$11.63	99,396,000
1919	692,455	9.27	6,421,478	...do	$11.74	75,420,000
Average, 1914–1918	603,763	10.02	6,050,741	...do	$6.92	41,843,000
Beet sugar:						
1920	882,000	2,516	2,219,200,000	Pound		
1919	692,455	2,098	1,452,902,000	...do		
Average, 1914–1918	603,763	2,612	1,577,235,000	...do		
Cane sugar, Louisiana:						
1920	196,000	1,898	372,000,000	...do		
1919	179,900	1,345	242,000,000	...do		
Average, 1914–1918	218,400	2,214	483,440,000	...do		
Maple sugar and sirup (as sugar):						
1920	[2] 19,031,325	[3] 1.91	36,373,080	...do	[4] 37.0	13,458,000
1919	[2] 18,974,700	[3] 2.16	41,004,533	...do	[4] 26.9	11,038,000
Sorghum sirup:						
1920	472,900	92.8	43,876,000	Gallon	105.2	46,138,000
1919	429,500	82.4	35,409,000	...do	110.3	39,054,000
Average, 1914–1918	261,565	86.3	22,580,000	...do		
Peanuts:						
1920	1,262,400	28.5	35,960,000	Bushel	135.8	48,829,000
1919	1,256,400	27.0	33,925,000	...do	240.9	81,742,000
Beans (6 States):						
1920	849,000	10.7	9,075,000	...do	$2.99	27,114,000
1919	1,002,000	11.9	11,935,000	...do	$4.28	51,051,000
Average, 1914–1918	1,295,000	10.2	13,213,000	...do	$4.60	60,777,000
Kafirs (7 States):						
1920	5,404,000	26.6	143,939,000	...do	91.5	131,665,000
1919	5,031,000	25.4	127,568,000	...do	129.4	165,030,000
Broom corn (7 States):						
1920	199,200	[5] 340.4	33,900	Ton	$125.78	4,263,000
1919	262,600	[5] 386.9	50,800	...do	$153.64	7,805,000
Onions (17 States):						
1920	56,972	335.6	19,119,500	Bushel	131.7	25,179,000
1919	42,057	271.0	11,397,500	...do	213.3	24,309,000
Cabbage (12 States):						
1920	89,437	9.2	820,750	Ton	$30.78	25,266,000
1919	55,110	6.5	357,025	...do	$52.74	18,828,000
Hops (4 States):						
1920	29,200	1,332.8	38,918,000	Pound	36.5	14,194,000
1919	25,900	1,133.1	29,346,000	...do	77.2	22,656,000
Cranberries (3 States):						
1920	24,900	17.3	431,000	Barrel	$12.32	5,313,000
1919	25,600	22.1	566,000	...do	$8.37	4,735,000
Average, 1914–1918	22,980	19.2	442,000	...do	$7.00	3,093,000
Apples, total:						
1920			240,442,000	Bushel	113.1	271,984,000
1919			153,238,000	...do	186.0	285,069,000
Average, 1914–1918			202,698,000	...do	90.2	182,762,000
Apples, commercial:						
1920			36,272,000	Barrel	$3.64	132,006,000
1919			26,223,000	...do	$5.36	140,649,000
Peaches:						
1920			43,697,000	Bushel	210.2	91,862,000
1919			49,578,000	...do	191.3	94,818,000
Average, 1914–1918			47,514,000	...do	111.5	52,998,000
Pears:						
1920			17,279,000	...do	157.5	27,220,000
1919			15,472,000	...do	182.5	28,238,000
Average, 1914–1918			12,364,000	...do	104.2	12,885,000
Oranges (2 States):						
1920			27,200,000	Box	$2.58	70,125,000
1919			22,075,000	...do	$2.67	58,956,000
Soy beans:						
1920	190,000	15.8	3,002,000	Bushel	306.4	9,199,000
1919	175,000	14.1	2,460,000	...do	346.7	8,530,000
Cowpeas:						
1920	1,683,000	9.2	15,495,000	...do	230.8	35,768,000
1919	1,453,000	6.5	9,421,000	...do	274.5	25,865,000
Total:						
1920	350,870,409					9,165,348,000
1919	356,123,122					14,081,391,000

Trees tapped. [3] Pounds per tree. [4] May 15 price. [5] Pounds per acre

STATES LEADING IN STAPLE CROPS.

TABLE 296.—*Production of staple crops in leading States, 1918–1920.*

Crop.	1920		1919		1918	
		Million bushels.		*Million bushels.*		*Million bushels.*
Corn	Iowa	474	Iowa	416	Iowa	353
Wheat	Kansas	137	Kansas	152	North Dakota	106
Oats	Iowa	230	Iowa	196	Iowa	245
Barley	California	29	California	30	Minnesota	40
Rye	Michigan	10	North Dakota	16	North Dakota	20
Rice	Louisiana	25	Louisiana	20	Louisiana	17
Buckwheat	New York	4	New York	5	Pennsylvania	6
Kafirs (sorghum grains)	Texas	61	Texas	59	Texas	24
Potatoes	New York	46	New York	40	New York	37
Sweet potatoes	Alabama	17	Alabama	14	Alabama	14
Flaxseed	North Dakota	4	North Dakota	3	North Dakota	6
Beans (dry)	Michigan	4	California	5	California	9
Peanuts	Alabama	9	Alabama	7	Alabama	12
Apples (commercial)	New York	28	Washington	20	New York	18
Peaches	California	14	California	18	California	13
		Thousand tons.		*Thousand tons.*		*Thousand tons.*
Hay (all)	Nebraska	6,570	Nebraska	7,125	New York	5,430
Broom corn	Oklahoma	17	Oklahoma	27	Texas	19
Sugar beets			Colorado	1,790	Colorado	1,363
		Thousand bales.		*Thousand bales.*		*Thousand bales.*
Cotton	Texas	4,200	Texas	3,099	Texas	2,697
		Million pounds.		*Million pounds.*		*Million pounds.*
Tobacco	Kentucky	468	Kentucky	498	Kentucky	470

VALUE OF FARM PRODUCTS.

TABLE 297.—*Estimated value of farm products, 1879–1920, based on prices at the farm.*

Year.	Total, gross (to be read as index numbers).	Crops.		Animals and animal products.	
		Value.	Percentage of total.	Value.	Percentage of total.
1879 (census)	*$2,212,540,987*				
1889 (census)	*2,460,107,454*				
1897	3,961,000,000	$2,519,000,000	63.6	$1,442,000,000	36.4
1898	4,339,000,000	2,760,000,000	63.6	1,579,000,000	36.4
1899 (census)	*4,717,069,973*	*2,998,704,412*	*63.6*	*1,718,000,000*	*36.4*
1900	5,010,000,000	3,192,000,000	63.7	1,818,000,000	36.3
1901	5,302,000,000	3,385,000,000	63.8	1,917,000,000	36.2
1902	5,595,000,000	3,578,000,000	64.0	2,016,000,000	36.0
1903	5,887,000,000	3,772,000,000	64.1	2,116,000,000	35.9
1904	6,122,000,000	3,982,000,000	65.0	2,140,000,000	35.0
1905	6,274,000,000	4,013,000,000	64.0	2,261,000,000	36.0
1906	6,764,000,000	4,263,000,000	63.0	2,501,000,000	37.0
1907	7,488,000,000	4,761,000,000	63.6	2,727,000,000	36.4
1908	7,891,000,000	5,098,000,000	64.6	2,792,000,000	35.4
1909 (census)	*8,558,161,223*	*5,487,161,223*	*64.1*	*3,071,000,000*	*35.9*
1910	9,037,000,000	5,486,000,000	60.7	3,551,000,000	39.3
1911	8,819,000,000	5,562,000,000	63.1	3,257,000,000	36.9
1912	9,343,000,000	5,842,000,000	62.5	3,501,000,000	37.5
1913	9,850,000,000	6,133,000,000	62.3	3,717,000,000	37.7
1914	9,895,000,000	6,112,000,000	61.8	3,783,000,000	38.2
1915	10,775,000,000	6,907,000,000	64.1	3,868,000,000	35.9
1916	13,406,000,000	9,054,000,000	67.5	4,352,000,000	32.5
1917	19,331,000,000	13,479,000,000	69.7	5,852,000,000	30.3
1918	22,480,000,000	14,331,000,000	63.8	8,149,000,000	36.2
1919	24,961,000,000	16,013,000,000	64.2	8,948,000,000	35.8
1920 (preliminary)	19,856,000,000	11,145,000,000	56.1	8,711,000,000	43.9

CROP VALUE PER ACRE.

TABLE 298.—*Yearly value per acre of 10 crops combined.*

[Corn, wheat, oats, barley, rye, buckwheat, potatoes, hay, tobacco, and cotton, which comprise nearly 90 per cent of the area in all field crops, the average value of which closely approximates the value per acre of the aggregate of all crops.]

1920	$23.44	1906	$13.46	1892	$10.10	1878	$10.37
1919	36.33	1905	13.28	1891	11.76	1877	12.00
1918	33.73	1904	13.26	1890	11.03	1876	10.80
1917	33.27	1903	12.62	1889	8.99	1875	12.20
1916	22.58	1902	12.07	1888	10.30	1874	13.25
1915	17.18	1901	11.43	1887	10.14	1873	14.19
1914	16.44	1900	10.31	1886	9.41	1872	14.86
1913	16.49	1899	9.13	1885	9.72	1871	15.74
1912	16.09	1898	9.00	1884	9.95	1870	15.40
1911	15.36	1897	9.07	1883	10.93	1869	14.07
1910	15.53	1896	7.94	1882	12.93	1868	14.17
1909	16.00	1895	8.12	1881	13.10	1867	15.09
1908	15.32	1894	9.06	1880	13.01	1866	14.17
1907	14.74	1893	9.50	1879	13.26		

AGGREGATE CROP-VALUE COMPARISONS.

TABLE 299.—*Value of 22 crops and hypothetical value of all crops, with rank, 1909–1920.*

The following tabulation gives the estimated total value of 22 crops—corn, wheat, oats, barley, rye, buckwheat, flaxseed, rice, potatoes, sweet potatoes, all hay, tobacco, lint cotton, beans, broom corn, grain sorghums, hops, oranges, clover seed, peanuts, cranberries, and apples—in the United States, by States, in 1920, 1919, 1914–1918, and 1909; the value of all crops in 1909 (census); and the hypothetical value of all crops in other years, based upon ratio of the 22 crops to all crops in census year; also rank of States. The slight differences in the total value of crops in the United States between Tables 299 and 297 are due to different methods of estimating. In Table 299, where each State is shown separately, a more detailed method is used than is practicable in Table 297.

[Values in thousands of dollars; i. e., 000 omitted.]

State.	Value of 22 crops.			Value all crops 1909 (census).	Ratio value 22 crops to all crops in census 1909.	Hypothetical value of all crops.			Rank.	
	1920	1919	1909			1920	1919	1914–1918, 5-year average.	1920 22 crops.	1920 All crops.
Maine	65, 210	75, 822	30, 151	39, 318	77	84, 688	98, 470	67, 839	35	36
New Hampshire	18, 962	20, 435	10, 052	15, 976	63	30, 098	32, 437	24, 856	45	45
Vermont	42, 039	43, 056	19, 454	27, 447	71	59, 210	60, 642	42, 793	39	39
Massachusetts	39, 809	43, 638	18, 014	31, 948	56	71, 088	77, 925	55, 370	41	38
Rhode Island	3, 548	3, 936	2, 190	3, 937	56	6, 336	7, 029	6, 359	48	48
Connecticut	37, 513	46, 655	15, 847	22, 488	70	53, 590	66, 650	43, 503	42	41
New York	333, 250	356, 538	152, 935	209, 168	73	456, 507	488, 408	343, 336	5	5
New Jersey	60, 754	63, 863	25, 141	40, 341	62	97, 990	103, 005	80, 931	36	33
Pennsylvania	322, 070	384, 714	135, 766	166, 740	81	397, 617	474, 956	326, 312	6	7
Delaware	15, 060	19, 389	6, 694	9, 122	73	20, 630	26, 560	20, 173	46	46
Maryland	79, 807	98, 957	32, 393	43, 920	74	107, 847	133, 726	90, 512	33	32
Virginia	187, 038	271, 411	78, 603	100, 531	78	239, 792	347, 963	219, 804	22	23
West Virginia	84, 634	104, 945	30, 247	40, 375	75	112, 845	139, 927	95, 599	31	30
North Carolina	317, 528	504, 199	110, 728	142, 890	77	412, 374	654, 804	328, 622	8	6
South Carolina	220, 438	395, 570	110, 221	141, 983	78	282, 613	507, 141	266, 291	19	18
Georgia	258, 632	480, 333	180, 181	226, 595	80	323, 290	600, 416	397, 261	16	12
Florida	51, 902	62, 327	21, 545	36, 142	60	86, 503	103, 878	75, 493	37	35
Ohio	321, 786	494, 359	201, 431	230, 338	87	369, 869	568, 229	380, 937	7	9
Indiana	269, 776	420, 985	183, 976	204, 210	90	299, 751	467, 761	352, 952	13	15
Illinois	431, 628	755, 597	348, 114	372, 270	94	459, 179	803, 827	592, 885	3	3
Michigan	245, 762	328, 947	131, 665	162, 005	81	303, 410	406, 107	267, 021	17	14
Wisconsin	309, 832	382, 097	127, 108	148, 359	86	360, 270	444, 299	280, 766	9	10
Minnesota	268, 091	465, 021	179, 410	193, 451	93	288, 270	500, 023	349, 969	15	17
Iowa	436, 231	801, 292	297, 806	314, 666	95	459, 191	843, 465	558, 509	2	2
Missouri	301, 851	486, 677	195, 075	220, 664	88	343, 012	553, 042	349, 186	10	11
North Dakota	192, 248	289, 205	177, 513	180, 636	98	196, 171	295, 107	236, 834	21	25
South Dakota	183, 745	342, 555	120, 326	125, 507	96	191, 401	356, 828	256, 538	25	26
Nebraska	297, 275	529, 833	189, 474	196, 126	97	306, 469	546, 220	356, 376	11	13
Kansas	355, 730	593, 989	202, 086	214, 860	94	378, 436	631, 903	370, 730	4	8
Kentucky	225, 840	406, 318	117, 352	138, 973	84	268, 857	483, 712	257, 939	18	19
Tennessee	194, 438	275, 385	96, 195	120, 706	80	243, 048	344, 231	221, 870	20	21
Alabama	184, 801	306, 911	110, 563	144, 287	77	240, 001	398, 586	241, 148	24	22
Mississippi	165, 113	311, 521	108, 250	147, 316	73	226, 182	426, 741	249, 474	26	24
Louisiana	107, 078	178, 510	48, 281	77, 336	62	172, 706	287, 919	197, 308	29	27
Texas	611, 016	1, 053, 365	251, 430	298, 133	84	727, 400	1, 254, 006	641, 342	1	1
Oklahoma	268, 191	519, 503	121, 431	133, 454	91	294, 715	570, 882	252, 740	14	16
Arkansas	186, 206	302, 950	89, 004	119, 419	75	248, 275	403, 933	245, 515	23	20
Montana	71, 018	65, 112	27, 092	29, 715	91	78, 042	71, 552	95, 158	34	37
Wyoming	47, 973	47, 148	9, 328	10, 023	93	51, 584	50, 697	37, 333	38	42
Colorado	112, 265	150, 367	38, 203	50, 975	75	149, 687	200, 489	117, 351	28	29
New Mexico	41, 292	53, 200	6, 908	8, 922	77	53, 626	69, 091	31, 431	40	40
Arizona	34, 922	37, 682	4, 249	5, 497	77	45, 353	48, 938	25, 334	43	43
Utah	34, 072	38, 280	14, 532	18, 485	79	43, 129	48, 456	40, 323	44	44
Nevada	12, 449	14, 380	5, 568	5, 924	94	13, 244	15, 298	16, 504	47	47
Idaho	81, 202	113, 075	30, 330	34, 358	88	92, 275	128, 494	77, 997	32	34
Washington	129, 498	204, 780	68, 229	78, 927	86	150, 579	238, 116	132, 528	27	28
Oregon	88, 092	114, 445	39, 438	49, 041	80	110, 115	143, 056	89, 908	30	31
California	292, 960	326, 507	98, 628	153, 111	64	457, 750	510, 167	347, 466	12	4
United States	8, 640, 575	13, 385, 784	4, 619, 157	5, 486, 615	84. 2	10, 465, 015	16, 035, 111	10, 156, 426	......	......

AGGREGATE CROP ACREAGES.

TABLE 300.—*Acreage of 19 crops and theoretical acreage of all crops, by States, 1909–1920.*

[Crops included: Corn, wheat, oats, barley, rye, buckwheat, potatoes, sweet potatoes, tobacco, flax, rice, hay (all), cotton, peanuts, kafirs, beans, broom corn, hops, cranberries.]

State.	Acreage of given crops.				Acreage of all crops, 1909.	Per cent of given crops to all crops, 1909.	Theoretical acreage of all crops.		
	1920	1919	1918	1909			1920	1919	1918
Me	1,460,000	1,431,000	1,481,000	1,539,000	1,588,065	97	1,505,000	1,475,000	1,527,000
N. H	510,000	497,000	538,000	568,000	593,093	96	531,000	518,000	560,000
Vt	1,086,000	1,082,000	1,139,000	1,138,000	1,203,795	94	1,155,000	1,151,000	1,212,000
Mass	554,400	559,500	552,000	590,000	654,844	90	616,000	622,000	613,000
R. I	59,000	60,000	79,000	76,000	84,207	90	66,000	67,000	88,000
Conn	496,400	500,000	509,000	501,000	534,846	94	528,000	532,000	541,000
N. Y	7,798,600	7,844,000	7,983,800	7,911,000	8,387,731	94	8,296,000	8,345,000	8,493,000
N. J	1,004,800	1,024,200	1,019,700	999,000	1,114,903	90	1,116,000	1,138,000	1,133,000
Pa	7,803,000	8,014,000	8,052,600	7,637,000	7,826,562	98	7,962,000	8,178,000	8,217,000
Del	437,000	448,000	477,000	404,000	438,522	92	475,000	487,000	518,000
Md	2,040,000	2,131,000	2,088,000	1,788,000	1,934,954	93	2,194,000	2,291,000	2,245,000
Va	4,473,000	4,676,000	4,639,000	4,073,000	4,256,226	96	4,659,000	4,871,000	4,832,000
W. Va	2,125,000	2,156,000	2,205,600	1,799,000	1,874,382	96	2,214,000	2,246,000	2,298,000
N. C	7,082,400	6,996,400	7,387,500	5,419,000	5,737,037	94	7,534,000	7,443,000	7,859,000
S. C	6,447,100	6,559,700	6,381,900	4,810,000	5,152,845	93	6,932,000	7,053,000	6,862,000
Ga	11,941,800	11,824,200	11,972,700	9,276,000	9,662,383	96	12,439,000	12,317,000	12,472,000
Fla	1,268,200	1,315,200	1,370,800	1,122,000	1,223,078	92	1,378,000	1,430,000	1,490,000
Ohio	11,147,000	11,578,000	11,134,000	11,153,000	11,431,610	98	11,374,000	11,814,000	11,361,000
Ind	11,108,000	11,758,000	12,300,300	10,977,000	11,331,395	97	11,452,000	12,122,000	12,681,000
Ill	19,314,900	20,599,900	21,235,800	19,938,000	20,273,916	98	19,709,000	21,020,000	21,669,000
Mich	8,219,000	8,615,000	8,444,000	7,802,000	8,198,578	95	8,652,000	9,068,000	8,888,000
Wis	9,278,900	9,236,900	9,036,700	8,233,000	8,555,080	96	9,666,000	9,622,000	9,413,000
Minn	15,317,000	15,752,000	15,738,000	14,515,000	14,731,464	99	15,472,000	15,911,000	15,897,000
Iowa	21,031,000	21,421,000	21,355,000	20,090,000	20,374,925	99	21,243,000	21,637,000	21,571,000
Mo	14,226,400	15,045,400	14,787,250	13,925,000	14,335,588	97	14,666,000	15,511,000	15,245,000
N. Dak	16,582,000	17,472,000	18,020,000	15,728,000	15,888,756	99	16,749,000	17,648,000	18,202,000
S. Dak	14,822,000	14,825,000	14,735,000	11,916,000	12,226,772	97	15,280,000	15,284,000	15,191,000
Nebr	18,098,000	18,820,000	18,298,000	16,984,000	17,231,205	99	18,281,000	19,010,000	18,482,000
Kans	21,477,000	21,415,000	21,689,000	19,060,000	19,900,750	96	22,372,000	22,307,000	22,593,000
Ky	5,980,000	6,417,000	6,566,000	5,783,000	6,046,819	96	6,229,000	6,684,000	6,840,000
Tenn	6,647,000	6,673,000	6,725,800	6,125,000	6,365,143	96	6,924,000	6,951,000	7,006,000
Ala	9,678,000	9,654,600	9,573,100	6,977,000	7,205,239	97	9,977,000	9,953,000	9,869,000
Miss	7,842,000	7,719,300	7,894,000	5,968,000	6,158,719	97	8,085,000	7,958,000	8,138,000
La	4,538,500	4,400,400	4,530,300	3,182,000	3,586,348	89	5,099,000	4,944,000	5,090,000
Tex	25,493,000	24,622,000	23,509,000	17,414,000	18,389,092	95	26,835,000	25,918,000	24,746,000
Okla	13,586,500	13,696,000	13,254,000	11,501,000	11,921,670	96	14,153,000	14,267,000	13,806,000
Ark	6,834,200	6,767,800	7,218,400	5,187,000	5,376,484	96	7,119,000	7,050,000	7,519,000
Mont	4,525,000	4,857,000	5,124,000	1,827,000	1,848,113	99	4,571,000	4,906,000	5,176,000
Wyo	1,808,000	1,608,000	1,634,000	777,000	786,650	99	1,826,000	1,624,000	1,651,000
Colo	4,649,000	4,682,000	4,369,000	2,323,000	2,614,312	89	5,224,000	5,261,000	4,909,000
N. Mex	1,337,000	1,214,000	960,000	422,000	632,769	67	1,996,000	1,812,000	1,433,000
Ariz	520,000	456,000	451,000	177,000	190,982	93	559,000	490,000	485,000
Utah	1,019,000	976,000	1,032,000	714,000	755,370	95	1,073,000	1,027,000	1,086,000
Nev	384,000	392,000	444,000	391,000	392,387	99	388,000	396,000	448,000
Idaho	2,341,000	2,277,000	2,223,000	1,606,000	1,638,479	98	2,389,000	2,323,000	2,268,000
Wash	3,782,000	3,901,600	3,664,100	3,382,000	3,431,273	99	3,820,000	3,941,000	3,701,000
Oreg	2,760,000	2,749,600	2,706,000	2,236,000	2,281,288	98	2,816,000	2,805,000	2,761,000
Calif.[1]	5,530,000	5,621,000	5,805,000	4,659,000	4,924,733	95	5,821,000	5,920,000	6,111,000
U. S	346,462,100	352,343,100	352,332,350	300,622,000	311,293,382	96.6	359,420,000	365,348,000	365,197,000

[1] Includes cotton acreage in lower California (149,000 acres in 1920, 100,000 acres in 1919, and 88,000 acres in 1918).

WHEN CROPS ARE HARVESTED.

The tabulation below shows when crops are harvested in the United States by showing what proportion of the crop is usually harvested each month. Two factors tend to modify these percentages in any given year. In some years harvests come somewhat earlier or later than normal. Also, if the crop is larger than usual in its northern section and smaller than usual in its southern section, or vice versa, the effect is to modify the percentage of the total crop which is harvested in a particular month. However, it is not likely that such changes from normal are often so marked throughout the United States as to alter greatly the averages here given.

TABLE 301.—*Percentage of crops of United States harvested monthly.*

Crop.	January-April.	May.	June.	July.	August.	September.	October.	November.	December.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Barley	....	1.2	8.2	51.6	33.9	4.9	0.2	....	....
Buckwheat	....	....	....	.8	6.7	64.9	26.7	0.9	....
Corn	....	....	.1	.1	1.5	15.8	28.3	43.3	10.9
Oats	....	1.0	7.9	52.9	34.2	3.8	.2	....	....
Rice	....	....	....	.9	15.3	33.0	33.8	14.6	2.4
Rye	....	.2	11.3	71.5	16.3	.7	....	....	....
Wheat	....	.5	22.0	42.3	28.4	6.5	.3	....	....
Apples	....	.1	2.5	7.2	12.5	27.7	45.5	4.5	....
Blackberries	0.1	1.8	15.4	47.6	27.1	6.2	1.7	.1	....
Cantaloupes	.3	1.8	8.7	20.9	36.7	28.6	3.0	....	....
Cranberries	....	....	....	....	7.3	67.1	25.6	....	....
Grapes	....	....	.1	3.5	15.2	48.0	29.8	3.4	....
Peaches	....	1.6	7.9	23.4	34.3	26.9	5.9	....	....
Pears	....	.1	.4	7.5	25.1	44.4	21.5	1.0	....
Raspberries	....	.5	16.5	58.4	21.7	2.8	.1	....	....
Strawberries	4.8	23.6	49.4	18.3	3.1	.6	.1	.1	....
Watermelons	....	.4	5.2	27.3	39.8	24.1	3.2	....	....
Beans (dry)	....	....	....	.8	13.8	54.9	26.9	3.6	....
Beans (lima)	.1	.7	3.4	8.4	22.1	43.4	20.4	1.5	....
Cabbage	4.2	2.3	4.7	6.8	9.1	18.1	40.4	14.0	.4
Onions	1.7	4.4	8.7	12.6	17.2	32.5	21.9	1.0	....
Potatoes	.2	1.3	3.3	6.8	12.1	33.7	39.2	3.3	.1
Sweet potatoes	.1	....	.1	1.7	6.2	21.5	49.1	20.6	.7
Tomatoes	3.1	1.3	3.8	11.4	29.2	39.7	9.7	1.5	.3
Hay, all	.2	2.2	15.3	47.8	21.8	10.7	1.9	.1	....
Alfalfa	.9	5.3	24.1	28.0	21.5	16.4	3.7	.1	....
Alfalfa seed	....	....	.6	10.7	30.5	45.1	13.0	.1	....
Bluegrass seed	....	5.1	43.0	23.6	16.4	11.4	.5	....	....
Clover seed	....	....	.2	3.4	21.2	54.4	20.0	.8	....
Millet	....	.2	1.7	16.4	40.5	37.2	4.0	....	....
Timothy hay	....	....	7.1	73.6	17.8	1.5	....	....	....
Timothy seed	....	....	.8	36.1	54.0	9.1	....	....	....
Wild hay	.2	.6	4.1	28.9	36.5	26.4	3.3	....	....
Broom corn	....	....	2.8	9.7	29.0	43.1	14.4	1.0	....
Cotton	.4	....	....	1.4	11.5	31.6	34.4	16.0	4.7
Flaxseed	....	....	.1	3.0	31.5	56.5	8.9	....	....
Hops	....	....	....	1.1	27.6	63.6	7.7	....	....
Peanuts	....	....	.1	2.1	12.5	39.3	37.7	8.0	.3
Sorghum (sirup)	....	....	.1	1.4	13.3	51.9	30.9	2.4	....
Sugar beets	....	....	....	1.0	3.8	18.5	56.3	20.2	.2
Tobacco	....	....	.6	7.5	27.1	52.7	12.1	....	....

COMPOSITE CROP YIELDS.

TABLE 302.—*Composite numbers of all crop yields.*

The figures below are obtained in the following manner: For each State the average yield per acre of each crop (as corn, wheat, cotton, etc.) is reduced to its 10-year average yield per acre; these percentages are combined into a composite or general average, viz., the figures shown. The relative importance of each crop is taken into consideration in making the composite averages.

State and division.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
Maine	90	106	100	100	116	87	118	102	102	98
New Hampshire	104	105	106	110	122	85	114	89	119	93
Vermont	104	104	97	110	119	98	103	98	118	100
Massachusetts	107	103	98	105	110	96	116	96	107	90
Rhode Island	98	101	103	114	92	92	113	101	98	94
Connecticut	104	100	98	107	110	102	112	96	103	94
New York	110	107	102	108	108	100	111	91	105	90
New Jersey	121	97	100	102	107	107	105	101	106	89
Pennsylvania	109	105	102	101	106	101	106	98	110	91
North Atlantic	107.9	104.8	101.2	104.6	108.9	98.9	109.3	95.5	106.8	91.6
Delaware	111	91	91	104	101	99	109	97	112	96
Maryland	112	98	100	106	106	100	113	93	108	90
Virginia	109	102	105	108	113	114	90	107	101	91
West Virginia	109	102	99	103	110	113	95	93	123	78
North Carolina	107	92	106	97	95	103	108	104	102	100
South Carolina	99	94	98	102	83	92	104	106	102	103
Georgia	88	85	97	97	92	92	111	104	98	108
Florida	96	92	99	94	95	100	112	111	106	102
South Atlantic	100.4	93.1	100.3	100.7	102.9	99.6	105.1	103.5	103.6	99.6
Ohio	107	105	102	111	89	112	100	97	105	95
Indiana	106	96	110	109	92	113	93	95	102	95
Illinois	101	97	111	120	96	118	85	80	110	95
Michigan	109	100	90	98	93	100	111	94	101	98
Wisconsin	112	107	114	103	104	103	106	110	108	97
North Central east of Mississippi River	106.2	100.6	106.0	110.0	94.7	110.6	96.9	92.8	106.1	95.5
Minnesota	97	89	123	111	79	116	95	115	123	82
Iowa	113	107	104	111	107	103	105	102	128	82
Missouri	114	106	84	124	78	109	85	71	105	88
North Dakota	91	69	108	65	72	137	99	98	142	84
South Dakota	104	89	139	115	89	137	94	82	115	48
Nebraska	137	114	78	103	114	125	103	78	92	74
Kansas	129	111	82	92	82	125	124	61	117	72
North Central west of Mississippi River	113.0	100.2	101.1	104.6	90.6	118.2	101.9	88.6	117.3	78.1
Kentucky	106	95	100	109	102	108	102	83	104	96
Tennessee	105	96	96	105	101	104	98	88	102	98
Alabama	87	82	101	90	64	92	110	101	106	106
Mississippi	90	92	102	103	67	98	103	99	98	98
Louisiana	97	87	85	95	102	96	104	102	100	103
Texas	114	124	65	74	96	103	104	103	122	83
Oklahoma	140	139	66	87	79	122	106	62	99	64
Arkansas	107	98	76	110	92	104	97	94	99	101
South Central	107.4	105.5	83.6	93.0	88.0	103.8	103.1	92.3	105.8	91.2
Montana	83	40	69	55	86	107	90	94	98	106
Wyoming	113	65	105	88	87	99	98	92	103	85
Colorado	105	90	96	103	92	99	107	89	98	78
New Mexico	107	104	96	85	86	100	110	84	91	104
Arizona	97	112	94	100	109	94	98	116	112	86
Utah	103	78	94	109	88	94	100	92	105	93
Nevada	90	88	92	106	94	97	119	105	126	125
Idaho	98	82	89	91	89	98	95	102	108	106
Washington	92	94	75	83	105	104	101	101	105	102
Oregon	103	98	80	82	107	100	95	104	117	96
California	96	99	88	103	102	104	110	88	106	102
Far Western	96.9	88.5	85.3	91.2	97.7	102.1	102.6	95.1	102.9	99.4
United States	106.9	99.8	97.6	102.0	95.1	108.0	102.3	93.3	107.7	90.6

COMPOSITE CROP CONDITIONS, MONTHLY.

The character of seasons in past years for crops in the United States is indicated in the accompanying table of the composite condition of all important crops, monthly, during the growing period, 100 representing an average condition:

TABLE 303.—*Composite condition of growing crops, monthly, 1910–1920.*

Year.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.
1920	94.8	99.7	105.3	107.0	106.9	106.9
1919	104.7	102.4	97.8	98.8	98.7	99.8
1918	102.9	101.6	98.9	94.1	96.6	97.6
1917	94.2	97.8	99.8	102.5	102.4	102.0
1916	97.7	101.6	97.4	94.6	94.5	95.1
1915	102.3	102.3	103.9	105.5	106.9	108.0
1914	102.2	101.5	98.0	97.9	99.4	102.3
1913	98.9	98.2	95.5	89.9	90.3	93.3
1912	99.1	98.8	100.3	104.1	110.0	107.7
1911	97.2	89.3	85.4	84.8	86.7	90.6
1910	....	....	93.5	97.2	99.6	99.3

WEIGHTS PER BUSHEL.

A bushel is regarded as a definite weight rather than a cubic measure in the estimates of production and prices made by the Bureau of Crop Estimates. The weights which are regarded as a bushel for various products are as follows: Wheat, 60 pounds; corn, 56 pounds if shelled, 70 pounds if in ear; oats, 32 pounds; barley, 48 pounds; rye, 56 pounds; buckwheat, 48 pounds; white (Irish) potatoes, 60 pounds; sweet potatoes, 55 pounds; apples, 48 pounds; pears, 48 pounds; peaches, 48 pounds; walnuts and hickory nuts, 50 pounds; beans (dry), 60 pounds; onions, 57 pounds; turnips, 55 pounds; clover seed, 60 pounds; alfalfa seed, 60 pounds; timothy seed, 45 pounds; kafir corn, 56 pounds. Estimates of yields and prices in tons are always on the basis of 2,000 pounds.

TABLE 304.—*Estimated average weight in pounds per measured bushel of wheat, oats, and barley, of the yearly crops of the United States.*

Year.	Wheat.	Oats.	Barley.	Year.	Wheat.	Oats.	Barley.
	Pounds.	*Pounds.*	*Pounds.*		*Pounds.*	*Pounds.*	*Pounds.*
1920	57.4	33.1	46.0	1910	58.5	32.7	46.9
1919	56.3	31.1	45.2	1909	57.9	32.7	....
1918	58.8	33.2	46.9	1908	58.3	29.8	....
1917	58.5	33.4	46.6	1907	58.2	29.4	....
1916	57.1	31.2	45.2	1906	58.3	32.0	....
1915	57.9	33.0	47.4	1905	57.5	32.7	....
1914	58.0	31.5	46.2	1904	55.5	31.5	....
1913	58.7	32.1	46.5	1903	57.4	29.7	....
1912	58.3	33.0	46.8	1902	57.3	31.0	....
1911	57.8	31.1	46.0	1901	57.6	30.7	....

DISPOSITION OF FEED CROPS ON FARMS.

The following percentages of farm consumption in the United States of feed crops by the several kinds of live stock are based upon estimates made in 1918 by several thousand voluntary crop reporters of the actual amount fed to each class of stock:

TABLE 305.—*Farm consumption of feed crops by each class of stock.*

To—	Corn.	Oats.	Barley.	Rye.	Wheat.	Hay.	Silage.	Mill feed.
Horses	24.5	67.8	17.7	26.5	5.4	44.6	1.7	5.6
Cattle	19.2	13.2	11.9	5.5	6.4	51.4	96.9	44.2
Swine	50.3	10.8	59.9	53.4	29.1	.2	2.2	41.5
Sheep	.9	2.3	....	....	....	3.8	1.1	3.7
Poultry	5.1	5.9	10.5	14.6	59.1	....	.1	5.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WHEN FEED IS CONSUMED ON FARMS.

The following tabulation shows what proportion of each important feedstuff is consumed in each month, 100 per cent being the year's consumption for each product. The percentages are derived from reports of about 30,000 crop reporters of the actual quantities usually fed monthly on their farms. Pasture, which is not shown here, is the important source of feed in the summer months.

TABLE 306.—*Monthly consumption of feedstuffs.*

Month.	Corn.	Oats.	Barley.	Rye.	Wheat.	Hay.	Silage.	Mill feed.
Year	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
January	11.0	7.1	8.9	7.6	10.0	14.1	16.5	10.9
February	10.7	7.3	9.0	7.2	9.2	14.2	16.8	11.5
March	10.2	8.4	9.1	7.5	9.2	14.2	16.2	11.5
April	9.0	9.8	8.5	9.1	8.3	12.0	13.7	10.6
May	6.8	9.3	6.9	8.1	7.2	6.7	5.3	7.7
June	5.5	8.9	6.0	7.8	6.5	3.7	1.1	5.8
July	4.8	9.0	6.0	7.1	5.8	3.3	1.0	4.8
August	4.6	9.3	6.8	8.4	5.9	3.2	1.0	5.4
September	6.2	9.1	8.6	10.2	7.3	3.6	1.5	5.7
October	8.8	8.1	9.8	10.3	8.9	5.2	4.1	6.3
November	10.9	6.9	10.9	9.4	11.4	8.5	9.5	9.2
December	11.5	6.8	9.5	7.3	10.3	11.3	13.3	10.6

MONTHLY SALES FROM FARMS.

For every $100 worth of product sold from the farm, about $12.60 are sold in October, the month of heaviest total sales; $11.70 in November, $10.50 in December, and $10.10 in September—in the four months, $44.90. Smallest sales are in May and June, when the amount in each month is $6.10 of the year's $100.

Sales of crops alone are more concentrated in the fall months; for every $100 worth of crops sold in a year, $15.50 worth are sold in October, $15.70 in November, $12.60 in December, and $12.40 in September; in the four months, $56.20. Smallest sales ($3.10) are in June.

Sales of live-stock products are fairly evenly distributed through the year. For every $100 worth of live-stock products sold in a year $9.60 are sold in June, the highest proportion in any month, and $7.50 in January, the lowest.

These estimates are based upon reports made by crop correspondents of the Bureau of Crop Estimates of their actual sales in 1914, modified when necessary to make the figures typical of sales in recent years. More than 5,000 reports were tabulated. As the correspondents are representative farmers, the averages of their reports in the United States and in the larger States are probably nearly the same as the averages for all the farmers in the States. Details of monthly sales are given in tabulation below.

TABLE 307.—*Monthly percentages of year's receipts from sales by farmers.*

[Monthly rate of sales from farms, averages for recent years, estimates based upon reports of actual monthly sales made by crop correspondents of Bureau of Crop Estimates.]

FROM SALES OF ALL KINDS.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Maine	9.1	7.2	8.1	8.3	5.8	5.1	4.8	6.0	9.8	11.6	10.2	14.0	100.0
New Hampshire	9.3	9.4	7.6	10.3	6.1	5.8	8.4	8.2	7.9	10.2	8.4	8.4	100.0
Vermont	5.8	6.2	5.9	12.5	10.0	8.9	7.9	6.8	8.9	11.5	9.0	6.6	100.0
Massachusetts	5.6	5.2	6.1	7.9	5.9	6.9	9.6	10.8	10.3	12.2	10.3	9.2	100.0
Rhode Island	4.7	4.3	4.7	7.5	7.6	9.7	12.2	11.0	12.7	10.2	9.9	5.5	100.0
Connecticut	6.0	7.3	8.7	7.9	6.2	6.3	5.9	5.4	7.2	9.1	13.3	16.7	100.0
New York	7.1	6.4	7.1	7.9	7.4	7.9	7.5	7.1	9.2	12.3	12.4	7.7	100.0
New Jersey	3.5	3.0	4.7	3.4	5.0	5.9	11.5	20.9	21.8	8.9	5.3	6.1	100.0
Pennsylvania	7.5	6.8	9.5	8.3	10.1	6.0	6.0	8.3	9.4	9.8	10.1	8.2	100.0
North Atlantic	7.0	6.3	7.6	7.9	7.8	6.9	7.4	8.6	10.1	11.1	10.8	8.5	100.0
Delaware	11.2	7.0	6.9	5.8	11.3	10.6	9.3	8.4	5.7	8.7	8.6	6.5	100.0
Maryland	9.2	5.0	7.7	8.3	7.4	8.4	10.1	8.4	10.1	7.8	8.9	8.7	100.0
Virginia	8.3	7.4	7.0	6.2	6.2	6.8	8.8	7.4	8.1	16.3	9.1	8.4	100.0
West Virginia	4.8	5.6	6.9	4.6	4.8	7.0	7.4	8.6	13.1	23.2	6.8	7.2	100.0
North Carolina	9.2	5.2	4.3	6.6	3.4	3.4	4.2	4.2	6.7	12.3	18.4	22.1	100.0
South Carolina	11.5	5.7	7.1	5.1	2.9	3.1	3.4	4.9	11.1	14.4	16.3	14.5	100.0
Georgia	6.5	4.7	3.5	3.0	3.9	2.4	3.9	3.1	9.9	19.3	20.6	19.2	100.0
Florida	11.4	6.5	7.3	13.3	6.6	4.9	4.4	3.9	5.7	7.8	10.2	18.0	100.0
South Atlantic	8.4	5.8	5.8	5.8	4.7	4.8	5.9	5.6	9.0	15.6	14.1	14.5	100.0

MONTHLY SALES FROM FARMS—Continued.

TABLE 307.—*Monthly percentages of year's receipts from sales by farmers*—Continued.

FROM SALES OF ALL KINDS—Continued.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Ohio	10.1	6.8	8.2	7.0	6.2	9.0	8.4	8.9	9.3	8.5	7.6	10.0	100.0
Indiana	8.4	6.3	8.9	6.3	5.8	8.3	9.7	10.2	8.9	8.3	8.0	10.9	100.0
Illinois	7.1	7.3	10.3	7.8	9.2	8.6	7.1	7.8	9.7	6.4	9.2	9.5	100.0
Michigan	8.3	7.5	9.4	10.8	9.3	6.1	5.5	6.2	7.0	10.0	11.2	8.7	100.0
Wisconsin	9.2	7.9	8.2	8.4	7.7	8.4	6.8	6.4	8.4	10.1	9.7	8.8	100.0
North Central east of Mississippi River	8.4	7.0	9.2	7.7	7.6	8.3	7.7	8.3	9.0	8.1	8.9	9.8	100.0
Minnesota	9.6	7.6	9.4	7.4	6.7	5.4	4.4	3.7	10.1	12.9	12.2	10.6	100.0
Iowa	14.8	8.7	11.3	6.4	6.6	6.3	6.4	7.6	7.5	6.5	6.4	11.5	100.0
Missouri	7.8	8.5	6.1	7.8	6.6	6.4	8.3	9.8	8.9	8.3	9.9	11.6	100.0
North Dakota	7.2	5.2	6.2	5.6	5.9	7.2	3.9	6.9	12.2	18.0	12.6	9.1	100.0
South Dakota	6.9	4.7	5.5	4.5	3.2	3.7	4.2	3.7	16.5	20.0	16.9	10.2	100.0
Nebraska	10.6	9.7	8.4	8.3	7.0	7.4	7.3	6.5	10.9	8.0	8.2	7.7	100.0
Kansas	8.8	12.3	7.9	8.3	5.3	3.9	6.9	8.3	11.1	8.5	9.0	9.7	100.0
North Central west of Mississippi River	10.0	8.5	8.1	7.0	6.0	5.7	6.2	6.8	10.7	10.7	10.1	10.2	100.0
Kentucky	10.9	8.8	8.1	7.4	6.4	5.1	7.9	8.2	11.5	9.7	7.7	8.3	100.0
Tennessee	10.4	8.5	6.4	5.4	5.1	7.2	7.1	5.5	8.5	13.6	11.2	11.1	100.0
Alabama	8.1	6.8	9.3	5.5	3.0	3.3	3.1	5.2	7.7	15.0	17.1	15.9	100.0
Mississippi	10.1	2.7	3.9	3.4	2.8	2.4	2.6	2.2	6.9	19.8	23.6	19.6	100.0
Louisiana	8.0	6.9	4.9	3.7	3.3	3.0	5.4	4.2	14.8	19.9	16.1	9.8	100.0
Texas	5.9	3.6	4.0	4.4	5.5	1.9	3.5	4.1	16.1	21.2	16.9	12.9	100.0
Oklahoma	6.5	6.0	5.7	3.6	3.2	5.1	10.5	5.4	12.6	12.0	18.1	11.3	100.0
Arkansas	11.7	6.2	6.8	4.5	4.3	4.3	3.9	3.4	11.0	17.1	14.0	12.8	100.0
South Central	8.6	6.0	5.9	5.0	4.8	4.0	5.6	5.1	11.9	16.0	14.9	12.2	100.0
Montana	4.9	2.4	6.4	6.1	3.2	3.0	2.0	6.5	13.2	22.7	18.8	10.8	100.0
Wyoming	2.0	1.1	6.2	4.1	3.2	2.9	2.5	4.0	24.7	22.4	18.4	8.5	100.0
Colorado	9.8	8.0	4.9	9.6	4.4	4.3	3.6	3.1	6.2	16.4	21.9	7.8	100.0
New Mexico	3.9	2.8	4.6	15.0	4.1	2.2	1.5	1.7	9.7	35.9	11.5	7.1	100.0
Arizona	0.3	0.4	0.3	0.6	0.6	68.6	0.4	0.9	1.1	23.8	1.4	1.6	100.0
Utah	9.5	4.7	7.3	6.2	5.4	12.3	6.9	7.0	5.7	9.0	10.2	15.8	100.0
Nevada	6.5	7.2	4.2	17.4	15.7	2.9	8.4	16.9	3.6	3.7	6.3	7.2	100.0
Idaho	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	6.8	4.4	5.4	4.8	5.6	5.3	6.6	7.1	10.5	12.9	22.6	8.0	100.0
Oregon	5.1	4.7	4.8	10.8	8.1	7.7	6.4	7.0	7.6	17.7	12.0	8.1	100.0
California	3.2	2.5	3.7	4.3	4.4	8.1	7.4	10.6	6.5	25.4	14.3	9.6	100.0
Far Western	6.4	4.2	5.5	7.4	5.0	6.8	4.9	6.1	9.3	20.0	16.0	8.4	100.0
United States	8.5	6.8	7.4	6.9	6.1	6.1	6.4	6.9	10.1	12.6	11.7	10.5	100.0

FROM SALES OF CROPS.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Maine	11.9	5.5	9.7	6.8	2.2	1.8	1.1	2.5	12.0	18.6	14.3	13.6	100.0
New Hampshire	12.0	13.2	7.2	6.7	.8	2.0	11.4	13.2	7.4	12.1	6.5	7.5	100.0
Vermont	1.8	4.9	1.1	19.6	11.3	6.4	2.7	6.0	9.0	24.2	10.9	2.1	100.0
Massachusetts	1.7	1.9	3.6	5.8	2.1	5.9	7.1	11.4	16.4	20.2	13.7	10.2	100.0
Rhode Island	1.4	1.2	6.1	11.3	3.2	3.9	16.7	9.2	17.8	13.6	13.0	2.6	100.0
Connecticut	1.6	2.5	4.8	3.8	1.2	.4	1.9	2.7	3.8	9.4	31.6	36.3	100.0
New York	4.6	5.2	4.7	5.6	4.3	2.6	5.3	6.1	11.3	20.5	20.1	9.7	100.0
New Jersey	1.4	1.3	3.2	1.3	1.9	4.9	13.0	27.7	28.2	8.8	4.4	3.9	100.0
Pennsylvania	7.5	5.3	7.0	4.9	8.2	3.7	3.7	10.6	12.4	10.8	15.0	10.9	100.0
North Atlantic	5.3	4.5	5.5	5.1	4.8	3.3	5.8	10.4	13.9	15.4	15.7	10.3	100.0
Delaware	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	8.4	2.9	6.0	7.8	5.5	5.8	12.8	12.9	12.9	4.7	10.6	9.7	100.0
Virginia	11.0	8.9	5.7	4.4	3.5	3.8	13.9	12.3	7.3	8.4	12.3	8.5	100.0
West Virginia	14.5	15.2	4.0	3.9	3.0	2.6	5.1	9.5	8.7	13.8	9.7	10.0	100.0
North Carolina	8.8	3.2	3.5	7.1	1.7	2.3	2.7	2.1	4.5	14.6	22.3	27.2	100.0
South Carolina	11.0	4.6	6.2	2.3	1.3	1.9	2.0	4.7	11.7	16.9	20.1	17.3	100.0
Georgia	4.9	3.6	1.8	1.6	2.7	1.9	2.9	1.9	10.6	22.4	23.6	22.1	100.0
Florida	9.6	6.0	7.6	14.7	7.6	4.9	1.8	1.2	5.5	8.8	9.3	23.0	100.0
South Atlantic	8.7	5.0	4.3	4.5	2.7	2.7	5.1	5.0	8.5	15.3	19.0	19.2	100.0

MONTHLY SALES FROM FARMS—Continued.

TABLE 307.—*Monthly percentages of year's receipts from sales by farmers*—Continued.

FROM SALES OF CROPS—Continued.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year
Ohio	6.2	10.6	9.4	3.5	3.4	6.5	10.6	13.7	10.0	10.9	7.0	8.2	100.0
Indiana	8.9	6.1	5.8	4.5	4.2	3.4	17.0	17.2	11.1	8.8	6.7	6.3	100.0
Illinois	4.7	4.8	7.9	8.8	9.8	8.0	6.9	13.5	15.3	3.8	9.4	7.1	100.0
Michigan	8.6	7.6	6.6	8.9	5.2	3.5	4.3	6.8	9.3	14.6	14.6	10.0	100.0
Wisconsin	7.6	7.1	7.4	9.6	8.5	4.4	1.1	3.5	12.9	12.5	16.7	8.7	100.0
North Central east of Mississippi River	6.6	6.9	7.6	6.7	6.5	5.9	9.3	12.9	12.3	8.3	9.3	7.7	100.0
Minnesota	9.3	8.2	7.5	3.5	4.9	3.3	2.2	2.2	14.0	16.6	15.6	12.7	100.0
Iowa	11.2	5.5	6.8	4.5	8.2	3.1	8.1	7.4	16.1	8.7	6.9	13.5	100.0
Missouri	5.7	4.7	2.1	3.0	1.5	2.5	20.9	22.1	9.2	8.5	9.0	10.8	100.0
North Dakota	7.5	5.3	4.3	2.2	2.8	1.7	1.0	1.9	18.6	22.3	21.0	11.4	100.0
South Dakota	3.3	5.3	4.7	2.8	3.7	2.0	2.2	8.7	18.2	18.0	17.8	13.3	100.0
Nebraska	10.4	4.7	3.7	9.6	7.8	4.7	11.6	7.9	13.1	7.8	7.8	10.9	100.0
Kansas	6.6	9.7	10.4	6.5	2.6	1.2	9.8	10.8	12.8	7.5	9.6	12.5	100.0
North Central west of Mississippi River	8.1	6.3	5.8	4.6	4.4	2.6	7.1	7.3	15.0	13.6	13.2	12.0	100.0
Kentucky	15.5	11.8	10.5	5.9	4.5	2.1	9.2	9.8	8.3	3.4	7.0	12.0	100.0
Tennessee	10.6	6.7	5.9	5.2	5.4	7.9	11.8	6.7	4.0	8.7	14.1	13.0	100.0
Alabama	7.1	5.4	8.8	3.2	2.3	1.6	1.7	3.8	8.2	18.4	20.6	18.9	100.0
Mississippi	9.6	1.6	2.3	2.3	1.6	1.2	1.2	1.8	6.4	22.1	28.3	22.6	100.0
Louisiana	7.0	3.3	4.2	2.0	1.6	2.0	5.4	4.2	18.6	22.9	18.8	10.0	100.0
Texas	3.9	2.1	2.4	2.6	.7	1.2	2.9	3.8	17.7	25.8	21.4	15.5	100.0
Oklahoma	5.4	4.3	2.2	2.0	2.2	2.6	15.0	7.4	16.8	15.0	16.7	10.4	100.0
Arkansas	7.9	2.2	3.7	2.2	.9	1.1	2.6	2.8	6.1	31.0	21.3	18.2	100.0
South Central	7.4	4.2	4.4	3.1	2.1	2.3	5.8	4.8	12.3	19.3	19.1	15.2	100.0
Montana	3.7	2.0	1.3	2.6	2.6	.1	.2	8.6	16.4	27.5	22.1	12.9	100.0
Wyoming	2.5	1.3	9.0	4.0	5.5	.4	.3	.7	2.5	16.9	42.0	14.9	100.0
Colorado	12.2	7.1	6.1	3.4	3.6	2.5	4.0	4.9	9.8	14.1	20.5	11.8	100.0
New Mexico	8.5	5.4	8.2	4.8	2.7	1.8	3.6	4.6	9.6	11.0	18.7	21.1	100.0
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	7.7	3.0	2.3	2.9	2.5	1.5	6.4	9.5	7.0	7.0	18.7	31.5	100.0
Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	10.2	2.3	2.5	2.2	1.7	.9	1.7	3.9	14.9	15.8	38.0	5.9	100.0
Oregon	5.6	5.0	3.9	7.7	1.3	3.6	5.6	7.0	7.7	32.2	14.1	6.3	100.0
California	1.6	1.9	3.0	3.3	3.7	3.6	7.8	12.9	7.6	29.6	16.1	8.9	100.0
Far Western	7.1	3.2	4.0	4.0	3.0	2.6	5.0	8.2	10.2	22.8	19.7	10.2	100.0
United States	7.4	5.2	5.3	4.6	3.9	3.1	6.5	7.8	12.4	15.5	15.7	12.6	100.0

FROM SALES OF LIVE STOCK.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year
North Atlantic	7.5	6.4	9.6	10.8	10.6	5.2	5.8	5.6	8.8	9.6	12.7	7.4	100.0
South Atlantic	8.0	5.6	7.7	6.1	5.9	6.3	5.9	5.4	10.4	21.4	8.4	8.9	100.0
North Central east of Miss. R	9.8	6.8	10.9	7.9	7.0	9.5	6.1	5.0	7.5	7.9	9.4	12.2	100.0
North Central west of Miss. R	12.6	10.3	10.1	7.9	6.0	6.9	4.9	6.5	7.7	9.3	8.3	9.5	100.0
South Central	9.9	8.6	8.0	7.1	4.2	5.2	5.0	5.4	12.5	13.6	11.1	9.4	100.0
Far Western	5.9	4.5	5.0	11.3	5.3	9.2	4.5	2.4	9.4	21.9	14.6	6.0	100.0
United States	10.3	8.1	9.2	8.2	6.2	7.4	5.3	5.5	8.7	11.8	9.8	9.5	100.0

FROM SALES OF LIVE-STOCK PRODUCTS.

State and division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year
North Atlantic	7.8	7.6	8.3	8.7	9.2	9.1	8.7	8.4	8.0	8.7	7.7	7.8	100.0
South Atlantic	7.9	8.0	7.5	8.4	8.1	9.2	7.5	7.9	8.9	8.9	8.7	9.0	100.0
North Central east of Miss. R	8.0	7.4	8.4	9.1	10.0	9.5	8.6	7.7	7.7	7.9	7.8	7.9	100.0
North Central west of Miss. R	6.1	8.0	7.8	9.4	9.9	10.7	8.9	7.9	8.3	7.3	8.0	7.4	100.0
South Central	8.7	8.6	9.1	9.3	8.4	8.1	7.4	6.6	7.0	7.7	9.1	10.0	100.0
Far Western	6.3	5.9	7.0	8.0	8.5	10.7	8.7	8.6	7.4	10.4	10.6	7.9	100.0
United States	7.5	7.6	8.1	8.9	9.3	9.6	8.5	8.0	7.9	8.3	8.3	8.0	100.0

RECEIPTS FROM FARM SALES.

About 10,000 crop correspondents of the Bureau of Crop Estimates have reported their year's total value of all sales of farm products, divided into four classes, viz, (1) live animals, (2) animal products, (3) crops, (4) miscellaneous. Correspondents were requested to give their 1914 sales if that year was representative; if 1914 sales were not normal, they were to give figures which would be typical of sales in recent years.

Of every $100 worth of product sold by all who reported, approximately $36 were for live animals, $20 were for the products of live stock, $40 were for crops, and $4 represented miscellaneous items. As the correspondents are representative farmers, the averages of their reports in the United States and in the larger States are probably nearly the same as the averages for all the farmers in the States.

The character of farmers' sales varies widely in different sections of the country. In the cotton States, as would be expected, by far the greater part of the sales are as crops. Thus, in Georgia, for every $100 worth of products sold, $75 represents crops, $14 live animals, $8 animal products, and $3 miscellany. Even in Texas, regarded as a cattle as well as a cotton State, cotton so far predominates that $72 represents crops, $16 live animals, and $9 animal products out of every $100 of sales. It may be that the cattle section of the State is not so fully represented in the returns as the cotton section; but complete returns from all farmers probably would not materially modify these figures.

TABLE 308.—*Receipts from the sale of (1) live stock, (2) live-stock products, (3) crops, (4) miscellaneous, out of every $100 received from all sales; average of recent years.*

[From tabulation of reports from crop correspondents of the Bureau of Crop Estimates.]

State.	Live stock.	Live-stock products.	Crops.	Miscellaneous.	State.	Live stock.	Live-stock products.	Crops.	Miscellaneous.
Maine	$15	$42	$35	$8	Minnesota	$33	$20	$43	$4
New Hampshire	20	51	25	4	Iowa	63	12	22	3
Vermont	18	64	10	8	Missouri	62	13	21	4
Massachusetts	19	50	27	5	North Dakota	25	6	66	3
Rhode Island	13	62	22	1	South Dakota	41	18	36	5
Connecticut	12	62	24	2	Nebraska	56	9	32	3
New York	14	53	27	6	Kansas	39	16	42	3
New Jersey	6	26	62	6	Kentucky	45	19	31	5
Pennsylvania	21	42	32	5	Tennessee	42	12	40	6
					Alabama	17	14	66	3
Maryland and Delaware	23	32	42	3	Mississippi	12	8	76	4
Virginia	46	15	35	4	Louisiana	13	9	72	6
West Virginia	58	23	13	6	Texas	16	9	72	3
North Carolina	18	15	60	7	Oklahoma	32	11	53	4
South Carolina	8	12	72	8	Arkansas	34	11	48	7
Georgia	14	8	75	3	Mountain States[1]	49	13	34	4
Florida	16	16	64	4	Washington	16	46	36	2
Ohio	41	22	31	6	Oregon	33	32	30	5
Indiana	50	16	30	4	California	15	12	72	14
Illinois	42	20	35	3					
Michigan	34	30	31	5	United States	36	20	40	4
Wisconsin	31	47	17	5					

[1] Including Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, and Idaho.

PRODUCTIVITY OF VARIOUS COUNTRIES.

Index figures are usually applied to price comparisons, but they can as readily be used to compare the relative productivity of different countries. Six crops—wheat, oats, rye, barley, corn, and potatoes—comprise the bulk of crop production in most countries of the world. Of the total area in cultivated crops (before the war), excluding hay and grass crops, they comprised in Germany approximately 82 per cent; in France, 75 per cent; United Kingdom, 72; Denmark, 79; Holland, 70; Belgium, 75; Austria, 84; Hungary, 87; Italy, 45; Spain, 65; Roumania, 92; European Russia, 87; Asiatic Russia, 91; Bulgaria, 85; Algeria, 85; Japan, 31; Australia, 91; Canada, 91; Argentina, 88; United States, 82 per cent. Although these figures are only approximations, they are sufficiently accurate to indicate that index numbers of the relative yields per acre of these six products combined would fairly represent the relative per acre productivity of the various countries. For each country the average yield per acre for a series of years was obtained (except in a few countries where data for only one or two years were obtainable), and these average yields were reduced to their percentage of the average yield of all countries. The percentages for each country were combined, weighted in proportion to the relative acreage of the various crops in the country, to obtain the index number of production. Following is the result obtained, 100 representing the weighted average of all countries:

TABLE 309.—*Index numbers of productivity of countries named.*

Belgium	221	Sweden	136	Australia	76
Switzerland	202	Norway	128	Serbia	76
Netherlands	190	France	123	Argentina	75
United Kingdom	177	Austria	120	Portugal	73
Germany	169	Hungary	113	Russia, European	72
Denmark	168	United States	108	Russia, Asiatic	71
New Zealand	167	Italy	96	Uruguay	70
Egypt	161	Rumania	94	Algeria	65
Japan	137	Spain	93	Mexico	52
Canada	136	Bulgaria	87	Tunis	37
Chile	136	India	84		

WORLD PRODUCTION AND EXPORT TRADE.

TABLE 310.—*Production and export trade of the world in important crops, average, 1909–1913, in millions, i. e., 000,000 omitted.*

[Substantially the total production and exports for the world. However, China's probably large cotton production, also some minor items of production and exports for other countries, are omitted owing to lack of trustworthy information. One short ton=2,000 pounds.]

Crop.	Production.		Exports.			
	World.	United States production.	World.	Contributed by United States.	World crop exported.	United States crop exported.
		Per cent.		*Per cent.*	*Per cent.*	*Per cent.*
Wheat.........bushels..	3,726	18	745	13	20	15
Corn.........do....	3,807	71	745	17	7	2
Oats.........do....	4,324	26	[1] 234	[1] 5	[1] 5	[1] 1
Barley.........do....	1,468	12	[1] 300	[1] 3	[1] 20	[1] 4
Rye.........do....	1,788	2	[1] 108	[1] 0.8	[1] 6	[1] 2
Potatoes.........do....	5,471	6	[1] 75	[1] 2	[1] 1	[1] 0.5
Tobacco.........pounds..	2,712	37	929	41	34	38
Rice.........do....	110,780	0.6	12,721	0.1	11	2
Cotton.........500-pound bales..	21.1	62	14.0	64	66	69
Sugar.........short tons..	18.7	5	7.5	0.5	40	4

[1] Three-year average, 1911–1913.

FOREIGN TRADE IN FOODSTUFFS.

TABLE 311.—*Values of exports and imports of foodstuffs, in millions of dollars, 1913–1920.*

Item.	Year ending Dec. 31—							
	1920	1919	1918	1917	1916	1915	1914	1913
Exports of domestic foodstuffs:								
In crude condition, and food animals..........	917	678	547	509	421	462	275	170
Partly or wholly manufactured..	1,117	1,963	1,406	807	648	551	309	325
Total..........	2,034	2,641	1,953	1,316	1,069	1,013	584	495
Imports of foodstuffs:								
In crude condition, and food animals..........	578	545	346	386	260	243	235	221
Partly or wholly manufactured..	1,238	556	397	351	339	273	256	198
Total..........	1,816	1,101	743	737	599	516	491	419
Net exports..........	218	1,540	1,211	579	470	497	93	76

INDEX NUMBERS OF CROP PRICES.

TABLE 312.—*Index numbers of crop prices, monthly and average, 1911–1920.*

The trend of prices to farmers for important crops is indicated in the following figures; the base 100 is the average price December 1 in the 43 years 1866–1908 of wheat, corn, oats, barley, rye, buckwheat, potatoes, hay, flax, and cotton.

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 1	296.7	272.4	264.1	183.6	129.0	126.7	132.5	110.9	133.9	118.6	176.8
Feb. 1	311.0	259.9	271.6	195.6	139.9	140.5	132.1	112.6	140.2	119.8	182.3
Mar. 1	314.3	257.1	288.8	206.5	138.6	144.0	133.8	113.3	144.7	117.9	185.9
Apr. 1	334.1	271.2	288.6	225.2	140.2	144.5	134.2	113.6	153.4	118.0	192.3
May 1	362.1	293.7	281.8	280.6	143.3	150.0	135.9	116.2	166.3	122.2	205.2
June 1	380.4	307.2	271.9	291.3	145.8	147.3	138.8	121.2	168.3	127.7	210.0
July 1	374.0	310.2	272.9	289.9	144.8	139.1	137.7	122.9	160.1	136.3	208.8
Aug. 1	329.8	329.0	280.6	307.8	147.7	138.9	137.6	125.4	148.0	148.2	209.3
Sept. 1	294.7	317.7	293.3	279.6	161.5	132.5	141.3	136.3	137.6	141.6	203.6
Oct. 1	248.7	290.0	289.3	277.0	163.6	128.2	136.4	139.1	128.6	138.0	193.9
Nov. 1	201.1	279.4	269.5	261.3	178.8	124.4	127.4	133.9	118.3	135.6	183.0
Dec. 1	166.4	283.8	265.2	252.3	187.9	120.4	122.8	132.7	110.3	133.1	177.5
Average [1]	272.0	290.0	277.7	259.5	162.1	132.1	132.4	128.1	132.8	132.8	192.0

[1] Weighted average.

PRICES OF ARTICLES BOUGHT BY FARMERS.

TABLE 313.—*Prices of articles bought by farmers, 1909–1920, and purchasing power of 1 acre of crops.*

Item.	1920	1919	1914	1909	Price, per cent of 1914.			Purchasing power of 1 acre of crops, 100=1914.		
					1920	1919	1909	1920	1919	1909
Axes ... each	$2.22	$2.06	$0.96	$0.89	231	215	93	62	103	99
Barb wire ... 100 pounds	6.07	5.73	3.08	2.98	197	186	97	72	119	95
Barrels ... each	.76	.50	.25	....	304	200	......	47	110	......
Bone meal ... ton	65.00	60.00	31.90	....	204	188	......	70	118	......
Brooms ... each	.96	1.00	.38	.34	253	263	89	56	84	103
Buggies ... do	131.00	123.00	70.10	64.90	187	175	93	76	126	99
Buggy whips ... do	.79	.73	.426	.404	185	171	95	77	129	97
Calico ... yard	.227	.230	.063	.06	360	365	95	40	61	97
Churns ... each	3.05	2.90	2.30	2.19	133	126	95	107	175	97
Coal ... ton	13.30	9.50	5.80	5.50	229	164	95	62	135	97
Coal oil ... gallon	.255	.22	.139	.157	183	158	113	78	140	81
Coffee ... pound	.41	.46	.245	.211	167	188	86	85	118	107
Corn knives ... each	.65	.58	.29	.27	224	200	93	64	110	99
Cream separators ... do	100.40	95.00	59.30	63.10	169	160	106	84	138	87
Dinner plates ... ½ dozen	1.55	1.40	.57	.55	272	246	96	52	90	96
Dish pans, tin ... each	.88	.83	.34	.32	259	244	94	55	91	98
Dung forks ... do	1.53	1.40	.76	.70	201	184	92	71	120	100
Fertilizer, commercial ... ton	43.50	42.00	23.20	22.15	188	181	95	76	122	97
Flour ... barrel	12.90	13.50	6.40	6.30	202	211	98	71	105	94
Fruit jars ... dozen	1.22	1.15	.74	.73	165	155	99	86	143	93
Gasoline ... gallon	.335	.29	.179	.202	187	162	113	76	136	81
Gloves, cotton ... pair	.27	.26	....	....	......	......	......	......	......	......
Gloves, leather ... do	1.81	1.78	....	....	......	......	......	......	......	......
Grindstones ... pound	.05	.048	....	....	......	......	......	......	......	......
Halters ... each	1.93	1.85	.95	.85	203	195	89	70	113	103
Harness, single ... do	31.00	29.00	15.25	13.50	203	190	89	70	116	103
Hatchets ... do	1.42	1.29	.62	.59	229	208	95	62	106	97
Hats, felt ... do	4.80	4.30	2.03	1.94	236	212	96	60	104	96
Hoes ... do	.88	.83	.45	.41	196	184	91	73	120	101

PRICES OF ARTICLES BOUGHT BY FARMERS—Continued.

TABLE 313.—*Prices of articles bought by farmers, 1909–1920, and purchasing power of 1 acre of crops*—Continued.

Item.	1920	1919	1914	1909	Price, per cent of 1914.			Purchasing power of 1 acre of crops, 100=1914.		
					1920	1919	1909	1920	1919	1909
Horse blankets..........each..	$5.15	$5.00	$2.40	$2.25	215	208	94	66	106	98
Jumpers.................do....	2.50	2.50	.83	.77	301	301	93	47	73	99
Kitchen chairs...........do....	2.05	1.70	.80	.72	256	212	90	56	104	102
Lamps...................do....	1.03	.98	.52	.50	198	188	96	72	118	96
Lanterns.................do....	1.37	1.32	.80	.77	171	165	96	83	134	96
Lard...................pound..	.28	.34	.141	.132	199	241	94	72	92	98
Lime...................barrel..	3.05	2.65	1.36	1.29	224	195	95	64	113	97
Linseed oil.............gallon..	2.21	2.50	.82	.79	270	305	96	53	72	96
Lumber, 1-inch.......100 feet..	5.10	4.75	2.10	1.95	243	226	93	59	98	99
Manure spreaders........each..	193.00	180.00	106.70	111.60	181	169	105	79	131	87
Men's suits..............do....	39.00	38.10	14.00	13.15	279	272	94	51	81	98
Milk cans, 10-gallon......do....	6.05	6.00	2.45	2.40	247	245	98	58	90	94
Milk pails...............do....	1.00	.90	.45	.43	222	200	96	64	110	96
Mowers..................do....	87.00	84.00	46.50	44.30	187	181	95	76	122	97
Muslin..................yard..	.29	.31	.093	.09	312	333	97	46	66	95
Nails..............100 pounds..	7.30	6.50	3.40	3.34	215	191	98	66	116	94
Overalls.................pair..	2.63	2.60	.89	.82	296	292	92	48	76	100
Padlocks................each..	.57	.50	.275	.27	207	182	98	69	121	94
Paintbrushes.............do....	1.27	1.15	.54	.49	235	213	91	61	104	101
Paint, mixed...........gallon..	4.20	4.05	1.74	1.62	241	233	93	59	95	99
Paris green.............pound..	.64	.62	.30	.29	213	207	97	67	107	95
Picks....................each..	1.45	1.40	.72	.71	201	194	99	71	114	93
Pincers..................do....	1.05	.95	.51	.49	206	186	96	69	119	96
Pitchforks...............do....	1.40	1.30	.66	.62	212	197	94	67	112	98
Plows...................do....	22.00	21.00	12.10	11.50	182	174	95	78	127	97
Portland cement..100 pounds..	1.40	1.05	.69	.70	203	152	101	70	145	91
Raincoats...............each..	10.20	9.20	4.40	4.25	232	209	97	61	106	95
Rope, hemp.............pound..	.35	.36	.149	.135	235	242	91	61	91	101
Rubber boots............pair..	5.30	5.10	3.75	3.55	141	136	95	101	162	97
Sacks, grain.............each..	.42	.45	.163	.15	258	276	92	55	80	100
Saddles..................do....	43.90	42.40	20.35	17.45	216	208	86	66	106	107
Salt, for stock..........barrel..	3.38	3.00	1.65	1.50	205	182	91	70	121	101
Saws, buck..............each..	1.90	1.75	.92	.89	207	190	97	69	116	95
Scythes..................do....	2.03	1.82	1.06	1.02	192	172	96	71	128	96
Sheeting................yard..	.54	.58	.18	.17	300	322	94	48	69	98
Shingles................1,000..	8.00	7.90	3.70	3.50	216	214	95	66	103	97
Shirts, flannel...........each..	3.85	3.85	1.41	1.31	273	273	95	52	81	97
Shoes...................pair..	4.90	4.75	2.30	2.00	213	207	87	67	107	106
Shotguns................each..	33.00	28.00	12.85	12.45	257	218	97	55	101	95
Shovels.................do....	1.80	1.62	.78	.74	231	208	95	62	106	97
Staples............100 pounds..	7.60	6.80	3.75	3.69	203	181	98	70	122	94
Starch.................pound..	.123	.118	.07	.07	176	169	100	81	131	92
Steel wire.........100 pounds..	7.30	6.90	3.55	3.43	206	194	97	69	114	95
Stoves..................each..	57.00	50.00	24.00	22.50	238	208	94	60	106	98
Sugar..................pound..	.17	.15	.069	.058	246	218	84	58	100	109
Sulphur.................do....	.117	.119	.08	.075	146	119	94	98	148	98
Tedders.................each..	75.40	74.00	39.50	39.00	191	187	99	75	118	93
Tin pails................do....	.63	.59	.27	.25	233	219	93	61	101	99
Tobacco, plug..........pound..	.91	.93	.45	.45	209	207	100	68	107	92
Twine, binder............do....	.200	.258	.112	.103	179	230	92	80	96	100
Wagons, double.........each..	152.00	138.00	73.25	66.00	208	188	90	69	118	102
Wagons, single...........do....	93.00	83.00	48.00	45.50	194	173	95	71	128	97
Walking cultivators......do....	40.00	35.20	....	....	......	......	......	......	......	......
Wheelbarrows............do....	6.00	5.50	2.97	2.80	202	185	94	71	119	98
Wire fence...............rod..	.63	.59	.317	.311	199	186	98	72	119	94
Wooden buckets.........each..	1.00	.98	.35	.31	286	280	89	50	79	103
Wooden washtubs........do....	1.90	1.75	.83	.77	229	211	93	62	105	99
Average..................	....	....	....	....	219	208	95	67	111	97

FARM LABOR.

TABLE 314.—*Wages of male farm labor by classes and States, 1910 and 1920.*

State and division.	Per month.				Per day at harvest.				Per day other than harvest.			
	With board.		Without board.		With board.		Without board.		With board.		Without board.	
	1920	1910	1920	1910	1920	1910	1920	1910	1920	1910	1920	1910
Maine	$56.60	$23.50	$81.50	$34.50	$3.50	$1.50	$4.20	$1.95	$3.20	$1.23	$3.95	$1.60
New Hampshire	55.00	23.50	81.00	35.50	3.40	1.35	4.50	1.84	3.30	1.18	4.05	1.65
Vermont	52.10	25.00	73.30	35.50	3.60	1.75	4.40	2.25	2.90	1.21	3.70	1.60
Massachusetts	55.00	22.75	85.00	37.20	3.60	1.42	4.50	1.92	3.10	1.22	4.10	1.66
Rhode Island	55.00	21.00	81.00	34.00	3.10	1.35	4.40	2.05	2.70	1.12	3.80	1.56
Connecticut	56.00	21.00	82.00	36.00	3.60	1.55	4.60	2.00	3.05	1.07	3.95	1.55
New York	54.40	23.50	76.20	35.00	4.05	1.80	4.88	2.22	3.36	1.28	4.17	1.66
New Jersey	53.00	19.50	82.00	31.50	4.00	1.70	5.00	2.15	3.10	1.11	4.05	1.46
Pennsylvania	47.00	18.75	69.70	29.00	3.65	1.50	4.60	1.96	3.15	1.04	3.90	1.49
North Atlantic	51.92	21.65	75.54	33.19	3.78	1.63	4.68	2.08	3.20	1.17	4.01	1.58
Delaware	40.00	16.00	60.00	24.75	3.60	1.35	4.50	1.55	2.80	.98	3.50	1.22
Maryland	38.00	13.50	56.00	21.50	3.80	1.26	4.55	1.64	2.70	.88	3.45	1.18
Virginia	36.10	14.00	51.60	19.50	3.07	1.15	3.70	1.41	2.20	.78	2.84	1.01
West Virginia	48.50	19.40	68.30	29.00	3.25	1.28	4.05	1.65	2.52	.94	3.40	1.27
North Carolina	38.40	13.60	53.10	19.50	2.85	1.03	3.52	1.28	2.25	.73	2.85	.97
South Carolina	30.50	12.00	41.80	16.50	2.25	.96	2.76	1.12	1.80	.70	2.30	.90
Georgia	30.50	13.00	44.00	18.00	2.10	.98	2.60	1.23	1.88	.73	2.40	.95
Florida	34.50	15.00	50.00	25.00	2.20	1.10	2.80	1.46	2.00	.96	2.62	1.32
South Atlantic	35.75	13.77	50.56	19.75	2.69	1.07	3.30	1.33	2.13	.77	2.74	1.01
Ohio	48.00	21.00	66.50	29.00	4.11	1.67	4.95	2.07	3.19	1.20	3.98	1.57
Indiana	43.60	20.50	60.20	28.40	3.98	1.70	4.80	2.07	2.90	1.14	3.65	1.45
Illinois	52.90	24.50	68.40	32.90	4.40	1.90	5.20	2.30	3.25	1.31	4.00	1.63
Michigan	53.00	23.00	75.00	33.00	4.10	1.64	4.95	2.10	3.30	1.22	4.15	1.66
Wisconsin	62.00	26.00	84.50	37.25	4.15	1.76	5.05	2.20	3.50	1.35	4.35	1.78
N. C. east of Miss. R.	51.49	22.94	70.09	31.81	1.17	1.75	5.00	2.16	3.22	1.24	4.01	1.61
Minnesota	67.00	26.00	88.40	38.00	5.10	2.23	6.10	2.65	4.15	1.18	5.15	1.90
Iowa	66.35	28.00	83.50	39.00	5.00	2.12	5.85	2.51	4.08	1.57	4.89	1.98
Missouri	42.00	21.50	56.00	29.50	3.75	1.55	4.50	1.93	2.40	1.02	3.05	1.32
North Dakota	70.00	29.00	97.00	42.00	6.10	2.40	7.40	3.03	4.40	1.60	5.50	2.20
South Dakota	76.00	27.00	101.00	39.00	5.50	2.35	6.65	2.95	4.65	1.54	5.90	2.00
Nebraska	66.00	26.50	87.50	38.00	5.60	2.14	6.70	2.60	4.30	1.57	5.30	1.96
Kansas	57.00	24.00	77.50	34.00	6.00	2.18	6.75	2.57	4.30	1.42	5.20	1.84
N. C. west of Miss. R.	59.63	25.10	78.79	35.45	5.03	2.01	5.94	2.43	3.78	1.38	4.67	1.77
Kentucky	36.40	16.00	50.10	23.10	3.00	1.36	3.70	1.71	2.10	.85	2.70	1.12
Tennessee	33.00	14.00	46.00	20.00	2.50	1.14	3.05	1.41	1.85	.77	2.35	1.02
Alabama	29.30	13.00	42.20	18.50	1.90	.98	2.50	1.26	1.85	.85	2.40	1.05
Mississippi	28.50	13.30	41.00	19.50	1.95	.93	2.48	1.22	2.08	.83	2.65	1.10
Louisiana	35.00	13.50	51.00	20.25	2.35	.90	2.85	1.25	2.30	.77	2.75	1.02
Texas	42.00	18.00	60.00	24.50	3.25	1.22	3.85	1.57	2.65	1.04	3.25	1.32
Oklahoma	48.00	19.10	68.00	28.10	4.65	1.60	5.35	1.97	3.50	1.11	4.10	1.47
Arkansas	37.50	16.25	53.80	21.00	2.60	1.20	3.30	1.55	2.10	.90	2.75	1.20
South Central	36.53	15.28	51.94	21.90	2.80	1.14	3.41	1.47	2.29	.89	2.89	1.15
Montana	75.40	38.00	105.00	50.00	5.20	2.05	6.20	2.80	1.20	1.77	5.20	2.36
Wyoming	69.00	35.00	98.00	49.00	4.20	1.90	5.30	2.50	3.70	1.73	4.75	2.29
Colorado	65.00	29.50	92.00	41.50	4.50	1.95	5.50	2.47	3.70	1.47	4.60	2.00
New Mexico	51.00	24.50	72.00	34.25	3.25	1.16	3.75	1.88	2.50	1.12	3.25	1.58
Arizona	67.00	30.00	91.00	40.00	3.20	1.72	4.10	2.24	2.85	1.34	3.75	2.04
Utah	77.00	35.00	104.00	47.50	3.90	1.78	1.90	2.20	3.50	1.55	4.30	2.00
Nevada	77.00	37.00	107.00	54.00	4.20	1.82	5.50	2.38	3.50	1.39	4.75	1.96
Idaho	78.00	35.00	105.00	49.50	4.75	2.20	5.60	2.80	3.95	1.70	4.85	2.27
Washington	77.00	33.00	104.00	50.00	5.15	2.42	6.15	2.78	4.00	1.72	5.00	2.26
Oregon	68.00	32.00	89.00	41.50	4.45	2.12	5.30	2.60	3.85	1.51	4.80	2.07
California	79.00	33.00	107.00	47.00	4.50	1.98	5.40	2.48	3.60	1.44	4.60	2.02
Far Western	73.21	32.69	99.43	46.48	4.48	2.02	5.39	2.52	3.66	1.51	4.61	2.06
United States	46.89	19.21	64.95	27.50	3.60	1.45	4.36	1.82	2.86	1.06	3.59	1.83

FARM LABOR—Continued.

TABLE 315.—*Wages of classes of male farm labor, yearly, in United States, 1866–1920.*

Year.	By the month.		Day labor at harvest.		Day labor not harvest.	
	With board.	Without board.	With board.	Without board.	With board.	Without board.
1920	$46.89	$64.95	$3.60	$4.36	$2.86	$3.59
1919	39.82	56.29	3.15	3.83	2.45	3.12
1918	34.92	48.80	2.65	3.22	2.07	2.63
1917	28.87	40.43	2.08	2.54	1.56	2.02
1916	23.25	32.83	1.69	2.07	1.26	1.62
1915	21.26	30.15	1.56	1.92	1.13	1.47
1914	21.05	29.88	1.55	1.91	1.13	1.45
1913	21.38	30.31	1.57	1.94	1.16	1.50
1912	20.81	29.58	1.54	1.87	1.14	1.47
1911	20.18	28.77	1.49	1.85	1.09	1.42
1910	19.21	27.50	1.45	1.82	1.06	1.38
1902	16.40	22.14	1.34	1.53	.89	1.13
1899	14.07	20.23	1.12	1.37	.77	1.01
1898	13.43	19.38	1.05	1.30	.72	.96
1895	12.02	17.69	.92	1.14	.62	.81
1894	12.16	17.74	.93	1.13	.63	.81
1893	13.29	19.10	1.03	1.24	.69	.89
1892	12.54	18.60	1.02	1.30	.67	.92
1890	12.45	18.33	1.02	1.30	.68	.92
1888	12.36	18.24	1.02	1.31	.67	.92
1885	12.34	17.97	1.10	1.40	.67	.91
1882	12.41	18.94	1.15	1.48	.67	.93
1879	10.43	16.42	1.00	1.30	.59	.81
1875	12.72	19.87	1.35	1.70	.78	1.08
1869	16.55	25.92	1.74	2.20	1.02	1.41
1866	17.45	26.87	1.74	2.20	1.08	1.49

HOW FARM LABOR IS HIRED.

Of the total labor hired on farms of the United States, the percentage which is hired by the month, by the day, with board and without board, is estimated as follows, based upon reports of crop reporters of the Bureau of Crop Estimates:

TABLE 316.—*Percentage of total hired labor, by divisions.*

Item.	United States.	North Atlantic.[1]	North Central, east.[2]	North Central, west.[3]	South Atlantic.[4]	South Central.[5]	West.[6]
Hired by the—							
Month—	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
With board	36.1	39.3	41.8	52.7	33.7	29.0	37.4
Without board	15.5	16.5	15.1	9.4	17.2	17.0	9.5
Day, excluding extra harvest—							
With board	15.3	14.2	15.5	13.8	17.4	14.8	13.7
Without board	15.7	13.7	9.2	4.8	16.6	21.0	14.9
Day, harvest labor—							
With board	10.5	9.0	10.8	15.9	8.3	9.7	16.9
Without board	6.9	7.3	4.6	3.4	6.8	8.5	7.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hired with board	61.9	62.5	71.1	82.4	59.4	53.5	68.0
Hired without board	38.1	37.5	28.9	17.6	40.6	46.5	32.0

[1] Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania.
[2] Ohio, Indiana, Illinois, Michigan, Wisconsin.
[3] Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas.
[4] Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida.
[5] Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas.
[6] Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, California.

FARM AND LABOR INCOME.

TABLE 317.—*Average farm income and labor income on farms in the various areas studied by the Office of Farm Management.*

Farm income: The difference between receipts and expenses. It represents the amount of money available for the farmer's living above the value of family labor, provided he has no interest to pay on mortgages or other debts.

Labor income: The amount that the farmer has left for his labor after 5 per cent interest on the farm investment is deducted from the farm income. It represents what he earned as a result of his year's labor after the earning power of his investment has been deducted. In addition to the labor income the farmer received a house to live in, fuel (when cut from the farm), garden products, milk, butter, eggs, etc.

Areas.	Year.	Number of farms.	Average farm income.	Average labor income.
Cass and Menard Counties, Ill	1910	73	$3,176	$622
Guthrie and Green Counties, Iowa	1910	77	1,450	291
Chester County, Pa	1911	378	1,313	789
Lenawee County, Mich	1911	300	1,068	481
Muck-land farms of northern Indiana and southern Michigan	1914	100	1,917	1,072
Cut-over lands of Michigan, Wisconsin, and Minnesota	1914	801	391	49
Barry and Lawrence Counties, Mo	1914	244	822	370
Anderson County, S. C	1914	112	557	110
Brooks County, Ga	1914	106	952	502
New England;				
Southern New England	1914	719	837	392
Northern New England	1914	441	864	436
Southern Maine	1914	415	491	202
Frederick County, Md	1915	150	1,380	368
Mercer County, Pa	1916	349	668	285
Small farms around Washington, D. C	1916	152	700	408
Irrigated farms in southern Arizona	1913–1915	446	2,370	713
Utah Lake Valley, Utah	1913	69	867	417
Do	1914	75	1,312	728
Sumter County, Ga	1913	268	1,662	471
Do.[1]	1918	280	3,710	1,817
Washington County, Ohio (average of 7 years)[2]	1912–1918	175	606	272
Clinton County, Ind. (average of 7 years)	1910, 1913–1918	700	1,824	533
Dane County, Wis. (average of 5 years)[2]	1913–1917	300	1,293	408
Gloucester County, N. J. (average of 3 years)	1914–1916	375	1,536	1,013
Polk County, Fla. (average of 2 years)[2]	1917–18	105	1,916	843
Hillsboro County, Fla. (average of 2 years)[2]	1917–18	232	849	562
Frederick County, Va. (average of 2 years)[2]	1916–17	302	2,776	1,478
Salt Lake Valley, Utah	1915	428	778	162
Total		8,172		

[1] Same area repeated after a lapse of 5 years. [2] Surveys being continued over a period of years.

FARM LABOR SUPPLY AND DEMAND.

TABLE 318.—*Farm labor supply and demand, 1919–1921.*

State and division.	Farm labor supply, per cent of normal.			Farm labor demand, per cent of normal.			Per cent of supply to demand.		
	1921	1920	1919	1921	1920	1919	1921	1920	1919
Maine	92	70	90	91	92	98	101	76	92
New Hampshire	96	63	80	91	97	97	105	65	82
Vermont	88	75	80	98	100	103	90	75	78
Massachusetts	92	55	85	94	95	105	98	58	81
Rhode Island	85	59	88	100	100	103	85	59	85
Connecticut	96	53	86	97	115	105	99	46	82
New York	90	62	81	93	115	101	97	54	80
New Jersey	93	58	82	95	110	98	98	53	84
Pennsylvania	94	64	88	90	105	101	104	61	87
North Atlantic	92.1	62.3	82.8	92.7	107.8	101.0	99.4	57.8	81.9
Delaware	100	70	80	92	120	105	109	58	76
Maryland	87	75	80	91	102	104	96	74	77
Virginia	89	70	80	90	110	105	99	64	76
West Virginia	94	68	87	93	105	103	101	65	84
North Carolina	95	71	82	87	105	102	109	68	80
South Carolina	100	76	80	85	112	103	118	68	78
Georgia	95	75	85	80	106	105	119	71	81
Florida	96	70	76	92	110	106	104	64	72
South Atlantic	94.3	72.5	81.9	86.6	107.1	103.9	108.9	67.5	78.8
Ohio	92	68	86	91	105	102	101	65	84
Indiana	94	70	90	89	104	102	106	67	88
Illinois	98	72	87	93	109	101	105	66	86
Michigan	94	60	85	87	104	100	108	58	85
Wisconsin	97	70	85	95	110	101	102	64	84
North Central, east of Mississippi River	95.1	68.4	86.6	91.2	106.6	101.2	104.3	64,2	85.6
Minnesota	97	77	86	92	108	103	105	71	83
Iowa	99	84	90	92	109	101	108	77	89
Missouri	92	75	86	90	102	101	102	74	85
North Dakota	99	80	81	85	94	99	116	85	82
South Dakota	103	84	86	89	102	104	116	82	83
Nebraska	100	78	85	88	105	102	114	71	83
Kansas	94	71	81	83	97	97	113	73	84
North Central, west of Mississippi River	96.6	77.8	85.6	89.1	103.4	100.9	108.4	75.2	84.8
Kentucky	92	72	85	87	101	102	106	71	83
Tennessee	91	73	84	88	105	102	103	70	82
Alabama	95	70	85	81	110	105	117	64	81
Mississippi	92	75	77	85	110	104	108	68	71
Louisiana	92	73	85	78	103	103	118	71	83
Texas	98	71	81	83	100	97	118	71	81
Oklahoma	97	70	85	78	99	96	124	71	89
Arkansas	97	80	86	82	105	101	118	76	85
South Central	94.3	72.8	83.2	83.0	104.2	101.3	113.6	69.9	82.1
Montana	105	74	85	67	87	105	157	85	81
Wyoming	111	85	90	86	100	105	129	85	85
Colorado	105	80	90	87	99	103	121	81	87
New Mexico	107	85	90	85	100	100	126	85	90
Arizona	110	80	90	75	110	105	147	57	85
Utah	107	95	96	95	102	105	113	93	91
Nevada	98	90	90	95	105	102	103	86	88
Idaho	104	84	88	88	99	100	118	85	88
Washington	103	78	86	91	100	102	113	78	84
Oregon	99	78	88	92	101	100	108	77	88
California	99	84	93	93	101	103	106	81	90
Far Western	102.3	82.1	90.0	89.0	101.5	102.1	114.9	80.9	87.9
United States	95.2	72.4	84.4	87.5	105.3	101.8	108.8	68.8	82.9

FARM WORK DONE EACH MONTH.

TABLE 319.—*Percentage of total year's farm work done each month, based upon estimates of county crop reporters of the Bureau of Crop Estimates.*

[Black figures indicate the month in which most work is done.]

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Maine	0.8	0.8	2.2	7.5	16.5	**16.7**	15.7	10.8	15.8	8.5	3.5	1.2
New Hampshire	2.0	2.2	2.8	6.8	15.2	14.0	**16.6**	13.6	9.8	9.4	5.0	2.6
Vermont	1.7	1.6	3.5	6.5	15.7	12.3	**17.5**	14.5	10.0	10.0	4.2	2.5
Massachusetts	2.2	2.5	6.2	8.5	12.8	**15.2**	13.5	11.5	10.5	10.0	4.8	2.3
Rhode Island	2.3	2.3	5.7	12.7	**15.0**	10.0	9.3	7.7	13.3	11.0	5.7	5.0
Connecticut	4.0	4.0	5.0	8.5	11.5	12.3	**14.3**	10.2	10.5	9.2	6.5	4.0
New York	2.6	2.6	4.5	8.7	11.9	11.5	**13.9**	12.5	10.7	10.8	6.8	3.5
New Jersey	2.7	2.9	5.0	10.1	12.5	12.9	**13.5**	12.5	10.8	8.0	6.1	3.0
Pennsylvania	2.3	2.4	4.3	8.8	11.6	12.1	**14.5**	12.4	11.7	10.1	6.7	3.1
Delaware	2.3	2.7	3.3	9.0	11.3	14.0	**16.8**	10.3	11.3	11.0	5.0	3.0
Maryland	2.1	2.6	5.4	8.3	12.6	**14.0**	13.8	7.8	11.2	10.6	7.4	4.2
Virginia	2.4	3.0	5.9	10.1	12.2	**14.9**	13.2	8.2	10.9	9.1	6.3	3.8
West Virginia	1.7	3.4	8.9	11.7	13.2	**13.8**	13.7	9.6	9.8	7.7	4.7	2.7
North Carolina	2.7	3.5	6.8	10.1	12.2	**15.6**	11.5	7.4	8.4	10.0	7.8	4.0
South Carolina	3.0	4.1	8.0	11.3	13.3	**14.2**	8.9	5.4	8.3	11.1	8.9	3.5
Georgia	3.8	5.2	8.4	11.4	**13.2**	13.2	8.6	5.2	9.3	10.3	7.6	3.8
Florida	9.1	10.4	**11.8**	11.4	9.8	7.7	5.8	4.9	6.4	8.1	7.8	6.8
Ohio	2.5	2.8	5.2	9.1	11.5	12.7	**14.8**	11.3	10.8	8.9	6.6	3.8
Indiana	2.0	2.5	4.8	8.8	12.0	**14.9**	14.7	10.3	10.2	8.6	7.6	3.6
Illinois	2.0	2.5	5.2	9.0	12.5	13.5	**14.2**	10.8	9.4	8.7	8.6	3.6
Michigan	2.1	2.2	3.5	7.5	11.9	12.2	**14.3**	12.3	12.1	12.2	6.5	3.2
Wisconsin	2.5	2.6	3.7	9.5	12.5	11.7	**15.1**	13.7	12.0	8.7	4.9	3.1
Minnesota	2.6	2.8	4.5	10.5	10.9	9.9	12.1	**14.9**	13.5	10.3	5.3	2.7
Iowa	2.4	2.5	5.0	10.7	12.1	11.4	**12.8**	11.8	9.6	8.9	9.1	3.7
Missouri	2.5	3.5	6.9	10.3	13.0	**14.2**	12.8	8.0	9.2	8.3	7.4	3.9
North Dakota	2.4	2.5	4.0	10.2	13.8	8.0	10.0	14.8	**14.8**	10.7	5.6	3.2
South Dakota	2.4	2.7	4.9	10.8	12.1	10.6	11.5	**14.1**	10.5	9.2	7.2	4.0
Nebraska	2.5	2.5	4.8	8.1	10.7	12.1	**14.3**	13.2	10.4	9.2	8.0	4.2
Kansas	2.1	2.7	5.5	8.4	10.8	12.9	**15.8**	12.5	11.1	8.7	5.8	3.7
Kentucky	2.2	3.0	6.4	10.5	13.8	**15.8**	12.4	9.0	8.7	8.1	6.6	3.5
Tennessee	2.3	3.6	6.9	11.6	14.2	**16.0**	10.1	6.8	8.2	9.8	7.2	3.3
Alabama	3.1	5.1	9.0	12.7	**14.4**	14.4	7.8	4.1	6.7	11.1	7.4	4.2
Mississippi	2.7	4.1	9.0	12.1	13.1	**13.7**	10.2	5.9	7.3	10.3	8.2	3.4
Louisiana	3.6	7.0	11.0	**13.1**	11.7	10.6	5.8	5.3	8.0	11.4	8.5	4.0
Texas	4.0	5.4	8.4	9.9	12.1	**12.3**	8.1	6.5	10.6	11.3	7.4	4.0
Oklahoma	3.0	4.2	7.8	9.9	11.8	**14.0**	10.4	7.4	9.3	10.0	7.9	4.3
Arkansas	2.6	3.6	8.5	12.5	13.7	**14.5**	8.9	5.8	7.7	10.4	7.8	4.0
Montana	1.7	2.1	4.8	10.9	12.2	9.1	10.8	13.9	**14.4**	11.0	6.2	2.9
Wyoming	2.4	2.8	4.7	9.4	15.5	11.8	12.1	**13.6**	11.0	9.9	4.1	2.7
Colorado	1.7	2.0	4.5	9.7	13.2	9.8	10.3	**14.5**	12.7	12.3	6.3	3.0
New Mexico	2.3	3.8	6.7	13.1	12.7	9.3	9.7	11.2	**14.6**	9.9	3.9	2.8
Arizona	3.5	4.5	4.8	10.7	**15.7**	14.2	10.8	5.8	11.8	8.7	5.8	3.7
Utah	1.7	1.6	4.9	10.9	**16.4**	10.0	12.2	12.4	13.8	8.7	5.0	2.4
Nevada	3.2	4.0	10.0	9.5	8.0	13.0	**13.2**	11.2	10.8	8.8	4.5	3.8
Idaho	1.2	1.5	5.1	11.1	12.4	11.3	13.0	**11.7**	13.9	9.4	5.5	1.8
Washington	2.1	3.3	8.3	11.7	12.0	9.5	10.7	**12.5**	12.0	10.7	4.6	2.6
Oregon	2.3	4.1	7.5	9.8	9.0	10.5	13.4	**13.7**	12.9	8.7	5.5	2.6
California	5.3	5.6	7.6	8.2	8.9	**11.9**	11.7	11.0	10.4	7.8	6.8	4.8
United States	2.8	3.7	6.8	10.4	12.6	**13.1**	11.3	8.9	9.8	9.9	7.1	3.6

VALUE OF PLOW LANDS.

TABLE 320.—*Value of plow lands, by States, 1918–1921.*

State.	Average of poor plow lands.			Average of good plow lands.			Average of all plow lands.			
	1921	1920	1919	1921	1920	1919	1921	1920	1919	1918
Maine	$25.00	$30.00	$24.00	$50.00	$56.00	$50.00	$36.00	$42.00	$37.00	$35.00
New Hampshire	24.00	24.00	23.00	63.00	64.00	54.00	31.00	42.00	39.00	39.00
Vermont	29.00	30.00	30.00	67.00	69.00	64.00	47.00	48.00	44.00	44.00
Massachusetts	40.00	40.00	41.00	98.00	103.00	92.00	69.00	72.00	68.00	68.00
Rhode Island	50.00	50.00	47.00	105.00	105.00	92.00	85.00	85.00	73.00	70.00
Connecticut	34.00	35.00	37.00	90.00	100.00	80.00	58.00	60.00	55.00	52.00
New York	40.00	39.00	38.00	84.00	84.00	80.00	65.00	64.00	60.00	58.00
New Jersey	55.00	50.00	50.00	125.00	104.00	103.00	92.00	80.00	76.00	78.00
Pennsylvania	39.00	40.00	38.00	81.00	86.00	79.00	62.00	66.00	60.00	58.00
Delaware	38.00	44.00	36.00	72.00	86.00	70.00	55.51	66.00	55.00	59.00
Maryland	31.00	46.00	39.00	70.00	82.00	66.00	51.00	60.00	53.00	47.00
Virginia	32.00	34.00	31.00	70.00	73.00	62.00	50.00	53.00	47.00	43.00
West Virginia	31.00	32.00	29.00	70.00	75.00	64.00	48.00	51.00	44.00	43.00
North Carolina	36.00	42.00	31.00	76.00	87.00	67.00	55.00	63.00	50.00	42.00
South Carolina	32.00	41.00	27.00	68.00	82.00	56.00	50.00	61.00	45.00	36.00
Georgia	23.00	30.00	24.50	50.00	63.00	49.30	36.00	46.00	37.50	28.00
Florida	25.00	22.00	21.00	55.00	53.00	48.00	40.00	36.00	33.00	32.00
Ohio	60.00	69.00	63.00	110.00	132.00	113.00	88.00	105.00	91.00	86.00
Indiana	71.00	80.00	68.00	13[illegible].00	150.00	126.00	109.00	119.00	100.00	96.00
Illinois	105.00	115.00	100.00	195.00	213.00	170.00	157.00	170.00	144.00	132.00
Michigan	41.00	41.00	40.00	83.00	80.00	76.00	65.00	64.00	61.60	60.00
Wisconsin	65.00	66.00	60.00	122.00	125.00	110.00	98.00	100.00	89.00	82.00
Minnesota	74.00	73.00	59.00	121.00	120.00	88.00	101.00	100.00	78.00	75.00
Iowa	145.00	157.00	129.00	238.00	257.00	196.00	200.00	219.00	169.00	154.00
Missouri	58.00	60.00	51.00	106.00	110.00	91.00	83.00	87.00	72.00	66.00
North Dakota	30.00	31.00	27.50	49.00	49.00	43.00	42.00	43.00	37.00	35.00
South Dakota	66.00	67.00	50.00	102.00	108.00	77.00	85.00	90.00	67.00	56.00
Nebraska	80.00	85.00	67.00	140.00	150.00	115.00	115.00	125.00	95.00	80.00
Kansas	50.00	50.00	44.00	90.00	90.00	77.00	70.00	70.00	61.00	58.00
Kentucky	33.00	42.00	37.00	75.00	95.00	80.00	53.00	70.00	61.00	50.00
Tennessee	35.00	40.00	31.00	81.00	90.00	75.00	55.00	60.00	53.00	48.00
Alabama	17.00	20.00	17.00	38.00	43.00	33.00	26.00	30.00	24.00	21.00
Mississippi	16.00	23.00	16.00	36.00	49.00	33.50	26.00	35.00	25.50	23.00
Louisiana	24.00	34.00	25.00	50.00	65.00	44.00	38.00	50.00	33.00	33.00
Texas	33.00	36.00	27.00	70.00	72.00	58.00	52.00	56.00	46.00	45.00
Oklahoma	29.00	30.00	24.00	63.00	63.00	51.00	46.00	47.00	38.00	35.00
Arkansas	24.00	26.00	22.00	54.00	65.00	50.00	38.00	45.00	38.00	31.00
Montana	19.00	21.00	21.00	41.00	48.00	45.00	30.00	36.00	34.00	35.00
Wyoming	25.00	34.00	26.00	60.00	70.00	53.00	44.00	53.00	43.00	41.00
Colorado	35.00	40.00	36.00	86.00	88.00	80.00	67.00	66.00	60.00	55.00
New Mexico	30.00	30.00	30.00	60.00	60.00	60.00	45.00	45.00	45.00	42.00
Arizona	75.00	90.00	60.00	140.00	180.00	125.00	120.00	130.00	100.00	98.00
Utah	50.00	60.00	55.00	140.00	135.00	125.00	100.00	103.00	95.00	86.00
Nevada	45.00	46.00	50.00	90.00	110.00	110.00	75.00	80.00	85.00	80.00
Idaho	58.00	60.00	50.00	128.00	135.00	98.00	99.00	105.00	76.00	70.00
Washington	63.00	68.00	60.00	140.00	150.00	121.00	105.00	115.00	95.00	94.00
Oregon	60.00	60.00	53.00	135.00	130.00	108.00	103.00	100.00	81.00	81.00
California	75.00	70.00	69.00	200.00	175.00	165.00	135.00	130.00	121.00	120.00
United States	56.66	60.76	51.26	106.33	113.34	91.83	83.78	90.01	74.31	68.38

TRENDS IN AGRICULTURAL STATISTICAL DATA.

TABLE 321.—*Trends in agricultural statistical data.*

Year.	Land values.	Farm wages.	Crop prices.	Live-stock prices.	Crops and live stock.	Crop values per acre.	Articles farmers buy.	Crop yield per acre.
	Index numbers, basis, 100=5-year average, 1909–1913.							
1920	184	240	195	183	189	148	223	107
1919	202	207	221	212	217	232	212	102
1918	167	176	212	211	211	212	188	100
1917	153	142	198	181	189	209	153	104
1916	136	114	124	122	123	142	125	97
1915	123	105	101	104	102	108	112	110
1914	111	104	101	112	107	103	103	105
1913	109	105	98	110	104	104	103	95
1912	103	102	101	98	100	101	102	110
1911	99	99	101	90	96	97	100	93
1910	96	95	99	108	103	98	99	101
1909	93	98	101	95	98	101	97	101
1899	45	68	....	....	....	57	86	....
	Percentage change yearly.							
1920	− 7	+16	−12	−14	−13	−36	+ 5	+ 5
1919	+21	+18	+ 4	+ 1	+ 3	+ 9	+13	+ 2
1918	+ 9	+24	+ 7	+17	+12	+ 1	+23	− 4
1917	+13	+24	+60	+49	+54	+47	+22	+ 7
1916	+11	+ 9	+23	+17	+20	+31	+12	−12
1915	+11	+ 1	0	− 8	− 4	+ 5	+ 9	+ 6
1914	+ 2	− 2	+ 3	+ 3	+ 3	0	0	+10
1913	+ 5	+ 3	− 3	+12	+ 4	+ 2	+ 1	−13
1912	+ 5	+ 3	0	+ 8	+ 4	+ 5	+ 2	+19
1911	+ 3	+ 5	+ 2	−16	− 7	− 1	+ 1	− 9
1910	+ 3	− 4	− 2	+14	+ 6	− 3	+ 2	+ 1

NOTE.—Land values are obtained on Mar. 1 following the year shown on stub of tabulation; figures may be regarded as representing approximately values at the close of the years indicated, rather than average for entire year. Wage statistics are collected on Mar. 1 of the following year (1919 data collected in December); they are presumed to represent the average for the calendar year shown on stub, but they are probably influenced somewhat more by conditions in the last half of the year than by the first half. Crop prices and live-stock prices are calendar-year averages, obtained from monthly prices properly weighted. Figures for crops and live stock are the averages of the crop prices and live-stock figures as shown separately. The ratio of the value of all crops to the value of all live-stock products is usually about 6 to 4; but of total farm sales about 40 per cent are crops, 56 per cent live stock and live-stock products, and 4 per cent miscellaneous. Crop values per acre are obtained by dividing the total value of the year's crop production based upon Dec. 1 prices by the total acres producing the crops. Prices of articles which farmers buy are obtained at the close of the year indicated; although they are assumed to be averages for the year, they probably are influenced more by conditions in the latter part than in the early part of the year.

INDEX NUMBERS OF PRICES OF MEAT ANIMALS.

TABLE 322.—*Index numbers of prices of meat animals, monthly and average, 1911–1920.*

Date.	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	Average.
Jan. 15	12.14	13.46	12.59	8.53	6.46	6.57	7.05	6.40	5.44	6.40	8.50
Feb. 15	12.43	13.51	12.65	9.42	6.94	6.46	7.27	6.70	5.54	6.19	8.71
Mar. 15	12.52	14.06	13.06	10.70	7.53	6.46	7.37	7.08	5.69	6.09	9.06
Apr. 15	12.72	15.01	13.55	11.71	7.85	6.59	7.40	7.35	6.30	5.80	9.43
May 15	12.41	15.34	13.83	11.84	7.98	6.80	7.29	7.08	6.39	5.54	9.45
June 15	12.31	14.98	13.62	11.72	8.00	6.85	7.22	7.19	6.27	5.45	9.36
July 15	12.40	15.61	13.68	11.47	8.04	6.83	7.41	7.25	6.23	5.52	9.44
Aug. 15	12.12	15.56	14.21	11.84	8.05	6.74	7.63	7.20	6.56	5.87	9.58
Sept. 15	12.22	13.44	14.50	12.79	8.38	6.77	7.58	7.15	6.74	5.87	9.54
Oct. 15	11.67	12.22	13.79	13.04	8.04	6.96	7.14	7.14	6.86	5.58	9.24
Nov. 15	10.34	11.88	13.37	12.47	8.09	6.45	6.80	6.94	6.45	5.44	8.82
Dec. 15	8.48	11.54	13.40	12.74	8.15	6.25	6.61	6.85	6.42	5.37	8.58
Average[1]	11.69	13.59	13.49	11.56	7.77	6.63	7.19	7.00	6.25	5.77	9.09

[1] Weighted average.

MEAT PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION.

TABLE 323.—*Meat production, imports, exports, and consumption, 1900–1919.*

Production of dressed-weight meat in calendar years estimated by the Bureau of Crop Estimates for 1900, ascertained by the Bureau of the Census for 1909, estimated by the Bureau of Animal Industry for 1914–1919; edible offal estimated by the Bureau of Crop Estimates for all years from these percentages of dressed weights: Beef, 19.047 per cent; veal, 7.455 per cent; mutton, including lamb, 4.65 per cent; pork, including lard, 15.66 per cent. Some of the foreign trade numbers are approximate averages, and the small numbers of meat animals in this trade are not included. Beef statistics include veal; mutton includes lamb and goat; pork includes lard.

Class of meat.	1900	1909	1914	1915	1916	1917	1918	1919
	Production, dressed weight, and edible offal, in thousand pounds.							
Beef	8,962,805	9,545,343	7,177,981	7,384,045	7,859,854	8,670,651	9,876,410	8,737,029
Mutton	616,385	646,277	773,804	672,880	663,724	513,997	562,214	664,431
Pork	9,266,245	9,532,453	10,271,184	11,438,459	12,268,010	9,805,989	12,983,580	13,171,832
Total	18,865,435	19,724,073	18,222,969	19,495,384	20,791,588	18,990,637	23,422,204	22,573,292
	Trend of production since 1900 (1900=100).							
Beef	100.0	106.5	80.1	82.4	87.7	96.7	110.2	97.5
Mutton	100.0	104.8	125.5	109.2	107.7	83.4	91.2	107.8
Pork	100.0	102.7	110.6	123.2	132.1	105.6	139.8	141.8
Total	100.0	104.6	96.6	103.3	110.2	100.7	124.2	119.7
	Per capita production, in pounds.							
Beef	117.9	105.4	73.4	74.4	78.1	85.0	95.5	83.3
Mutton	8.1	7.1	7.9	6.8	6.6	5.0	5.4	6.3
Pork	122.2	105.3	105.0	115.3	121.9	96.1	125.5	125.6
Total	248.2	217.8	186.3	196.5	206.6	186.1	226.4	215.2
	Each class of meat as a percentage of total production, in percentages.							
Beef	47.5	48.4	39.4	37.9	37.8	45.7	42.2	38.7
Mutton	3.3	3.3	4.2	3.4	3.2	2.7	2.4	2.9
Pork	49.2	48.3	56.4	58.7	59.0	51.6	55.4	58.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Imports, in thousand pounds.							
Beef	2,500	4,500	258,803	120,402	40,425	27,639	30,296	90,310
Mutton			19,876	11,879	18,235	5,624	608	8,209
Pork		500	26,880	5,500	1,171	2,822	3,586	9,124
Total	2,500	5,000	305,559	137,781	58,831	36,085	34,490	107,643
	Domestic exports, in thousand pounds.							
Beef	857,542	499,828	192,088	546,478	395,535	408,611	797,061	436,092
Mutton	600	1,600	3,847	4,231	5,258	2,862	1,631	3,009
Pork	1,602,662	1,003,223	853,321	1,401,217	1,469,363	1,319,128	2,263,181	2,679,627
Total	2,460,804	1,504,651	1,049,256	1,951,926	1,870,156	1,730,601	3,061,873	3,118,728

MEAT PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION—Con.

TABLE 323.—*Meat production, imports, exports, and consumption, 1900–1919*—Contd.

Class of meat.	1900	1909	1014	1915	1916	1917	1918	1919
	Excess of domestic exports over imports, in thousand pounds.							
Beef	855,042	495,328	[1] 66,715	426,076	355,110	380,972	766,765	345,782
Mutton	600	1,600	[1] 16,029	[1] 7,648	[1] 11,977	[1] 2,762	1,023	[1] 5,200
Pork	1,602,662	1,002,723	826,441	1,395,717	1,468,192	1,316,306	2,259,595	2,670,503
Total	2,458,304	1,499,651	743,697	1,814,145	1,811,325	1,694,516	3,027,383	3,011,085
	Excess of domestic exports over imports as a percentage of production, in percentages.							
Beef	9.5	5.2	[1] 0.9	5.8	4.5	4.4	7.8	4.0
Mutton	.1	.2	[1] 2.1	[1] 1.1	[1] 1.8	[1] .5	.2	[1] .8
Pork	17.3	10.5	8.0	12.2	12.0	13.4	17.4	20.3
Total	13.0	7.6	4.1	9.3	8.7	8.9	12.9	13.3
	Domestic exports of animal fats and oils, in thousand pounds.							
Beef	245,000	200,000	100,657	159,206	118,756	52,728	92,788	158,333
Pork	655,000	450,000	460,580	489,312	456,603	383,997	555,460	784,946
Total	900,000	650,000	561,237	648,518	575,359	436,725	648,248	943,279
	Domestic exports of animal fats and oils as a percentage of domestic exports of total meat, in percentages.							
Beef	28.6	40.0	52.4	29.1	30.0	12.9	11.6	36.3
Pork	40.9	44.9	54.0	34.9	31.1	29.1	24.5	29.3
Total	36.6	43.2	52.5	33.2	30.8	25.2	21.2	30.2
	Consumption, dressed weight and edible offal, in thousand pounds.							
Beef	8,107,763	9,050,015	7,244,696	6,957,969	7,501,744	8,289,679	9,109,645	8,391,247
Mutton	615,785	644,677	789,833	680,528	675,701	516,759	561,191	669,631
Pork	7,683,583	8,529,730	9,444,743	10,042,742	10,799,818	8,489,683	10,723,985	10,501,329
Total	16,407,131	18,224,422	17,479,272	17,681,239	18,980,263	17,296,121	20,294,821	19,562,207
	Trend of consumption since 1900 (1900=100).							
Beef	100.0	111.6	89.4	85.8	92.6	102.2	112.4	103.5
Mutton	100.0	104.7	128.3	110.5	100.7	83.9	91.1	108.7
Pork	100.0	111.0	122.9	130.7	140.6	110.5	130.6	136.7
Total	100.0	111.1	106.5	107.8	115.7	105.4	124.3	119.2
	Per capita consumption, in pounds.							
Beef	106.7	99.9	74.1	70.1	74.6	81.2	88.0	80.0
Mutton	81.	47.1	8.1	6.9	6.7	5.1	5.4	6.4
Pork	101.1	94.2	96.5	101.2	107.3	83.2	103.7	100.1
Total	215.9	201.2	178.7	178.2	188.6	169.5	197.1	186.5

[1] Excess of imports over domestic exports.

SECTIONAL MEAT CONSUMPTION IN THE UNITED STATES.

By the processes of arriving at the meat consumption of this country, followed by the census method and by the estimates made in the Department of Agriculture, it has been impossible to determine what it is in any part of the Nation. Only a national average could be obtained. To provide information for each of the divisions into which the country is customarily divided, the Bureau of Crop Estimates has appealed to many of its local crop correspondents to make careful estimates of per capita consumption, with subdivision of the people of their districts into urban and rural, and estimates for each class. The request was for "pounds of dressed weight as would be sold by the butcher." The resulting averages for the United States, urban and rural combined, are approximately the same as those secured by national statistics and estimates of slaughter, reduced by the exported national surplus—lower for beef and higher for the other classes of meat. The interest of the investigation is chiefly in the geographic differences, and in the comparison between farm and town consumption; these can be observed in the accompanying table. Estimates were made for poultry as well as for "meat."

TABLE 324.—*Estimated per capita meat consumption.*

Class.	Total.	Beef.	Veal.	Mutton.	Pork.	Poultry.
URBAN.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
North Atlantic	166.8	64.0	13.5	10.9	61.5	16.9
North Central, east	176.8	75.6	11.6	7.3	69.3	13.0
North Central, west	181.4	77.5	11.7	6.8	67.2	18.2
South Atlantic	158.4	55.1	5.7	5.4	76.3	16.0
South Central	178.4	66.1	4.4	8.7	79.7	19.5
Western	177.8	76.2	16.3	13.6	60.5	11.2
Total	171.6	68.3	11.8	9.3	66.3	15.8
RURAL.						
North Atlantic	174.7	47.1	10.7	7.6	85.5	23.9
North Central, east	196.2	48.3	7.2	5.8	109.9	25.1
North Central, west	212.7	57.4	6.3	3.8	113.1	32.0
South Atlantic	172.4	28.5	3.2	4.4	117.6	18.7
South Central	182.4	28.6	1.7	6.9	121.3	23.9
Western	188.2	64.7	9.3	15.8	81.5	16.9
Total	187.1	41.6	5.4	6.5	109.7	23.9
TOTAL POPULATION.						
North Atlantic	168.8	59.6	12.8	10.0	67.7	18.7
North Central, east	186.0	62.7	9.5	6.6	88.5	18.7
North Central, west	202.3	64.1	8.1	4.8	97.8	27.4
South Atlantic	168.9	35.2	3.8	4.7	107.1	18.0
South Central	181.6	36.3	2.3	7.3	112.8	23.0
Western	183.1	70.3	12.7	14.7	71.3	14.1
Total	179.9	54.0	8.4	7.8	89.6	20.2

States included in the different divisions are: North Atlantic—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania; North Central, east—Ohio, Indiana, Illinois, Michigan, Wisconsin; North Central, west—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; South Atlantic—Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas; Western—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, California.

AUTOMOBILE AND ROAD STATISTICS.

TABLE 325.—*Motor car registrations, registration revenues, and expenditures for roads and bridges in United States.*

[The following statistics are condensed from more detailed data published in Public Roads for May.]

Year.	Number motor cars registered.	Total registration revenues.	Total cash, road and bridge expenditures.[1]	Year.	Number motor cars registered.	Total registration revenues.	Total cash, road and bridge expenditures.[1]
1919	7,565,000	$64,697,000	$400,000,000	1912	1,020,000	$5,600,000	$156,000,000
1918	6,147,000	51,477,000	300,000,000	1911	710,000	4,000,000	140,000,000
1917	4,983,000	37,501,000	290,000,000	1910	500,000	2,200,000	120,000,000
1916	3,513,000	25,865,000	280,000,000	1909	250,000	950,000	100,000,000
1915	2,446,000	18,246,000	275,000,000	1908	120,000	500,000	90,000,000
1911	1,711,000	12,382,000	250,000,000	1907	90,000	350,000	80,000,000
1913	1,260,000	8,200,000	175,000,000	1906	48,000	200,000	74,000,000

[1] These expenditures do not include value of statute labor and pertain only to roads outside of city or town limits.

Until very recently all of the States did not require annual registrations of motor cars. Consequently the earlier figures do not represent very closely the actual number of cars in the United States at that time. It is believed, however, that these figures do represent very closely the actual registrations as made in each of the years.

AUTOMOBILE AND ROAD STATISTICS—Continued.

TABLE 326.—*Automobile and road statistics, by States.*

[The State and United States figures in first, fourth, and fifth columns are taken from Public Roads for May. The other figures were computed in the Bureau of Crop Estimates.]

State.	Automobiles registered,[1] 1919.	Per cent increase over 1918.	Miles of public rural roads.	Road miles per square mile.	Motor cars per mile of public rural road.	Population per motor car.
Maine	53,425	19.9	23,000	0.8	2.3	15
New Hampshire	31,625	27.4	14,000	1.6	2.2	14
Vermont	26,807	18.9	14,000	1.5	1.9	14
Massachusetts	247,182	27.7	19,000	2.3	13.2	16
Rhode Island	44,833	27.3	2,000	2.0	20.6	15
Connecticut	102,410	19.0	14,000	2.9	7.3	13
New York	566,511	23.3	80,000	1.7	7.1	19
New Jersey	190,873	22.7	15,000	2.0	12.9	17
Pennsylvania	482,117	22.3	91,000	2.0	5.3	19
North Atlantic	1,745,783	23.3	272,000	1.7	6.4	17
Delaware	16,152	24.7	4,000	1.9	4.4	13
Maryland	95,634	28.1	16,000	1.7	5.8	15
Virginia	94,100	30.3	52,000	1.3	1.8	24
West Virginia	50,203	29.6	31,000	1.3	1.6	29
North Carolina	109,017	50.8	52,000	1.1	2.1	23
South Carolina [2]	70,143	26.4	44,000	1.4	1.6	24
Georgia	137,000	30.9	81,000	1.4	1.7	22
Florida	55,400	2.2	18,000	.3	3.1	17
South Atlantic	663,049	28.5	298,000	1.1	2.2	21
Ohio	511,031	23.8	87,000	2.1	5.9	10
Indiana	227,255	....	73,000	2.0	3.1	13
Illinois	478,438	22.8	96,000	1.7	5.0	13
Michigan	325,813	24.3	74,000	1.3	4.4	10
Wisconsin	236,290	20.4	76,000	1.4	3.1	11
North Central east of Mississippi River	1,778,827	19.6	406,000	1.7	4.4	11
Minnesota	259,741	27.0	93,000	1.1	2.8	9
Iowa	364,043	30.8	104,000	1.9	3.5	6
Missouri	244,363	30.0	98,000	1.4	2.5	14
North Dakota	82,885	15.6	64,000	.9	1.3	10
South Dakota	104,628	15.6	95,000	1.2	1.1	7
Nebraska	200,000	15.4	80,000	1.0	2.5	7
Kansas	228,600	20.8	109,000	1.3	2.1	8
North Central west of Mississippi River	1,484,260	24.4	642,000	1.3	2.0	9
Kentucky	90,008	36.6	56,000	1.4	1.6	27
Tennessee	80,422	27.7	47,000	1.1	1.7	29
Alabama	58,898	27.6	54,000	1.0	1.1	41
Mississippi [3]	59,000	21.9	45,000	1.0	1.3	34
Louisiana	51,000	27.5	24,000	.5	2.1	37
Texas	331,310	31.9	127,000	.5	2.6	14
Oklahoma	144,500	18.9	111,000	1.6	1.3	17
Arkansas	49,450	19.3	49,000	.9	1.0	36
South Central	864,588	27.6	515,000	.8	1.7	23
Montana	59,324	16.2	40,000	.3	1.5	9
Wyoming	21,371	31.9	14,000	.1	1.5	9
Colorado	104,865	26.0	39,000	.4	2.7	10
New Mexico	18,082	2.5	45,000	.4	.4	25
Arizona	28,919	21.2	12,000	.1	2.4	10
Utah	35,236	9.2	9,000	.1	4.0	13
Nevada	9,305	14.0	12,000	.1	.8	13
Idaho	42,220	30.8	25,000	.3	1.7	11
Washington	148,775	26.9	43,000	.6	3.5	12
Oregon	83,332	31.6	38,000	.4	2.2	11
California	477,450	17.1	61,000	.4	7.8	7
Far Western	1,028,939	20.6	337,000	.3	3.1	9
United States [4]	7,565,446	23.1	2,470,000	.8	3.05	14

[1] Does not include motor cycles nor dealers' and manufacturers' licenses.
[2] State registrations only.
[3] Estimated.
[4] Includes 35,400 automobiles registered in the District of Columbia.

RAILWAY FREIGHT TONNAGE.

TABLE 327.—*Tonnage carried on railways in the United States, 1916–1919.*[1]

Product.	Year ending June 30—Class I and II roads, 1916.	Year ending Dec. 31— Class I roads. 1916	1917	1918	1919
FARM PRODUCTS.					
Animal matter:	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*
Animals, live	16,963,922	17,294,304	17,905,829	17,257,034	19,394,966
Packing-house products—					
Dressed meats	2,656,235	2,807,571	2,965,709	3,713,766	3,398,402
Hides and leather	1,400,858	1,396,132	1,357,265	1,302,754	1,370,701
Other packing-house products	2,774,708	2,633,043	2,566,603	3,510,231	3,735,977
Total packing-house products	6,831,801	6,836,746	6,889,577	8,526,751	8,505,080
Poultry (including game and fish)	1,016,484	1,096,624	1,022,472	1,154,040	1,322,404
Wool	503,248	504,927	499,054	493,651	546,852
Other animal matter	4,629,143	4,740,560	5,541,214	6,338,483	5,724,360
Total animal matter	29,944,598	30,473,161	31,858,146	35,769,959	35,493,662
Vegetable matter:					
Cotton	4,052,241	4,212,062	3,552,222	3,550,117	3,803,356
Fruit and vegetable	18,192,083	17,621,285	17,678,958	18,735,809	19,726,069
Grain and grain products—					
Grain	57,686,165	55,684,841	46,372,019	55,866,640	52,374,922
Grain products—					
Flour	10,472,225	10,318,950	10,065,219	10,587,769	11,669,659
Other grain products	7,992,496	8,234,081	8,413,089	8,630,062	9,078,660
Total grain and grain products	76,150,886	74,237,872	64,850,327	75,084,471	73,123,241
Hay	7,312,879	7,213,164	8,314,485	8,239,412	7,483,108
Sugar	3,917,381	3,762,495	4,235,353	4,204,165	4,933,861
Tobacco	1,085,843	1,016,198	1,028,771	1,159,572	1,293,494
Other vegetable matter	8,988,002	9,304,818	9,204,495	9,256,889	9,604,051
Total vegetable matter	119,699,295	117,397,894	108,864,611	120,230,435	119,967,180
Total farm products	149,643,893	147,871,055	140,722,757	156,000,394	155,460,842
OTHER FREIGHT.					
Products of mines	706,029,210	680,122,775	732,655,519	731,790,653	589,950,958
Products of forests	106,856,873	93,819,387	100,838,196	97,042,938	94,075,639
Manufactures	182,916,449	185,024,643	188,795,813	176,197,263	163,825,292
All other (including all freight in less than carload lots)	92,776,482	95,162,207	101,006,438	99,031,912	92,798,540
Total tonnage	1,238,222,907	1,202,000,067	1,264,018,723	1,263,063,190	1,096,111,271

[1] Compiled from reports of the Interstate Commerce Commission. Original shipments only, excluding freight received by each railway from connecting railways and other carriers. Figures exclude the relatively small tonnage originating on railroads of Class III (roads having operating revenues of less than $1,000,000 a year), except that for the calendar years 1916 and 1917 only Class I roads are included (roads having annual operating revenues in excess of $1,000,000).

CARLOAD WEIGHTS.

TABLE 328.—*Average weight per carload of freight originating on Class I railroads in the United States, during the three months ending June 30, 1920.*

[Interstate Commerce Commission.]

Commodity.	Tons.	Commodity.	Tons.
Wheat	39.4	Hogs	9.7
Corn	36.2	Poultry	11.3
Oats	30.0	Eggs	11.6
Flour and meal	30.9	Butter and cheese	13.2
Hay, straw, and alfalfa	12.2	Wool	12.6
Tobacco	13.9	Sugar, sirup, glucose, and molasses	28.0
Cotton	12.4	Canned goods	24.8
Citrus fruits	17.5	Anthracite coal	48.0
Potatoes	18.7	Bituminous coal	50.1
Horses and mules	11.4	Textiles	12.8
Cattle and calves	11.7	Lumber, timber, box shooks, staves, and headings	26.8
Sheep and goats	10.3		

WAGON AND MOTOR-TRUCK HAULS.

TABLE 329.—*Wagon and motor-truck hauls from farms to shipping points, 1906 and 1918.*

Item.	Distance.	Round trips per day.	Load.			Cost of hauling per ton per mile.		
			Corn.[1]	Wheat.	Cotton.	Corn.	Wheat	Cotton.
United States:	*Miles.*	*Number.*	*Bushels.*	*Bushels.*	*Bales.*	*Cents.*	*Cents.*	*Cents.*
Motor trucks, 1918	11.3	3.4	58	84	6.6	15	15	18
Wagons, 1918	9.0	1.2	39	56	3.6	33	30	48
Wagons, 1906	9.7	1.2	39	55	3.4	19	19	27
Geographic division.[2]								
New England:								
Motor trucks, 1918	10.0	4.5	62	60	....	11	14	....
Wagons, 1918	7.2	1.8	38	45	....	39	38	....
Wagons, 1906	7.2	1.7	....	....	....	....	....	....
Middle Atlantic:								
Motor trucks, 1918	12.2	3.4	69	78	....	14	11	....
Wagons, 1918	7.6	1.6	39	47	....	39	38	....
Wagons, 1906	6.5	1.7	41	48	....	24	26	....
South Atlantic:								
Motor trucks, 1918	9.8	4.0	45	57	6.0	19	18	20
Wagons, 1918	8.4	1.4	29	36	3.5	41	39	48
Wagons, 1906	9.9	1.2	35	42	3.4	28	21	27
North Central, east:								
Motor trucks, 1918	9.3	4.8	64	90	....	11	9	....
Wagons, 1918	6.3	2.0	41	54	....	29	26	....
Wagons, 1906	7.0	1.8	40	48	....	16	18	....
North Central, west:								
Motor trucks, 1918	10.1	3.8	54	84	....	18	14	....
Wagons, 1918	7.9	1.5	42	57	....	33	29	....
Wagons, 1906	8.7	1.4	39	52	....	17	16	....
South Central, east:								
Motor trucks, 1918	12.9	3.2	58	86	7.6	12	10	13
Wagons, 1918	10.4	1.0	26	38	3.2	45	36	52
Wagons, 1906	11.1	1.0	29	37	3.0	24	23	31
South Central, west:								
Motor trucks, 1918	13.0	2.9	57	72	6.7	17	15	20
Wagons, 1918	10.9	1.0	26	46	3.8	49	32	47
Wagons, 1906	12.6	.9	29	38	3.8	22	21	26
Rocky Mountain:								
Motor trucks, 1918	21.0	1.2	48	70	....	36	29	....
Wagons, 1918	20.2	.4	46	66	....	52	42	....
Wagons, 1906	16.8	.7	49	60	....	16	20	....
Pacific:								
Motor trucks, 1918	12.3	2.9	74	105	....	20	17	....
Wagons, 1918	11.2	1.4	71	67	....	23	22	....
Wagons, 1906	11.5	1.1	45	76	....	28	21	....

[1] Not shelled.

[2] The geographic divisions are—New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; Middle Atlantic: New York, New Jersey, Pennsylvania; South Atlantic: Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; North Central east of the Mississippi River: Ohio, Indiana, Illinois, Michigan, Wisconsin; North Central west of the Mississippi River: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; South Central east of the Mississippi River: Kentucky, Tennessee, Alabama, Mississippi; South Central west of the Mississippi River: Louisiana, Texas, Oklahoma, Arkansas; Rocky Mountain: Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho; Pacific: Washington, Oregon, California.

RURAL AND AGRICULTURAL POPULATION.

TABLE 330.—*Rural and agricultural population in various countries.*

Country.	Rural population.			Population dependent upon agriculture.		
	Year.	Number.	Per cent of total population.	Year.	Number.	Per cent of total population.
United States	1910	49,348,883	53.7			
Austria-Hungary:						
Austria				1900	13,447,362	51.4
Hungary				1900	13,061,118	67.8
Total Austria-Hungary				1900	26,508,480	58.4
Belgium	1910	1,654,277	22.3			
British India				1901	191,691,731	65.1
Bulgaria				1905	3,089,301	76.6
Denmark	1911	1,647,350	59.7	1911	1,023,962	37.1
Finland				1900	1,555,357	57.3
France	1906	22,715,011	57.9	1891	17,435,888	45.7
Germany				1907	17,089,496	27.7
Norway				1900	854,787	38.5
Portugal	1890	3,458,996	68.5	1900	3,367,199	62.1
Roumania	1900	4,836,904	81.2			
Russia:						
Caucasus				1897	7,266,428	78.2
Central Asia				1897	6,361,466	82.1
Poland				1897	5,302,850	56.4
Russia proper				1897	69,470,360	74.3
Siberia				1897	4,448,456	77.2
Total Russia				1897	92,849,560	73.9
Serbia				1900	2,097,988	84.2
Sweden				1900	2,344,612	45.6
Switzerland	1900	1,047,795	31.6	1900	1,067,905	32.2
United Kingdom:						
England and Wales	1911	7,907,556	21.9			

RURAL AND AGRICULTURAL POPULATION—Continued.

TABLE 331.—*Number of persons engaged in agriculture in various countries.*

Country.	Year.	Males.		Females.		Total persons engaged in agriculture.	
		Number.	Per cent of males in all occupations.	Number.	Per cent of females in all occupations.	Number.	Per cent of persons in all occupations.
United States	1910	10,582,039	35.2	1,806,584	22.4	12,388,623	32.5
Algeria	1881	636,078	74.8	91,602	53.7	727,680	71.3
Argentina	1895	318,149	28.0	67,174	13.4	385,323	23.6
Australia	1901	377,626	29.5	39,029	11.1	416,655	25.6
Austria-Hungary	1900	8,185,250	58.5	5,935,805	70.3	14,121,055	63.0
Belgium	1900	533,665	23.6	163,707	17.6	697,372	21.9
Bolivia	1900	....	....	....	....	564,009	43.5
British India	1901	63,026,365	67.3	27,867,210	66.5	90,893,575	67.1
British North Borneo	1901	....	....	....	....	32,892	64.2
Bulgaria	1905	895,206	73.3	837,406	94.9	1,732,612	82.4
Canada	1901	707,997	45.4	8,940	3.7	716,937	39.9
Ceylon	1901	745,074	65.0	318,551	65.4	1,063,625	65.1
Chile	1907	448,546	50.3	21,877	6.2	470,423	37.7
Cuba	1907	364,821	52.2	3,110	4.2	367,931	47.6
Cyprus	1901	33,611	62.8	2,757	20.8	36,368	54.5
Denmark	1911	386,016	45.7	110,169	28.5	496,185	40.3
Egypt	1907	2,258,005	67.2	57,144	33.3	2,315,149	65.6
Federated Malay States	1901	115,027	28.2	52,324	82.7	167,351	35.5
Finland	1900	321,538	51.4	102,008	39.6	423,546	48.0
Formosa	1905	763,456	70.6	263,664	82.4	1,027,120	73.3
France	1906	5,452,392	41.9	3,324,661	43.2	8,777,053	42.4
Germany	1907	5,146,723	27.7	4,585,749	48.3	9,732,472	34.6
Greece	1907	321,120	47.3	6,972	12.2	328,092	44.6
Grenada	1901	8,816	57.1	7,722	49.7	16,538	53.4
Italy	1901	6,370,277	57.9	3,196,063	60.5	9,566,340	58.8
Jamaica	1911	....	....	....	....	271,493	66.1
Malta and Gozo	1901	10,235	13.3	3,613	15.8	13,848	13.9
Mauritius	1901	72,493	57.1	5,989	38.0	78,482	55.0
Netherlands	1899	490,694	32.9	79,584	18.4	570,278	29.6
New Zealand	1911	103,644	28.5	7,472	8.3	111,116	24.5
Norway	1910	....	....	....	....	307,528	33.4
Philippine Islands	1903	1,163,777	57.8	90,286	8.8	1,254,063	41.3
Porto Rico	1899	196,893	73.3	1,868	3.9	198,761	62.8
Portugal	1900	1,127,268	65.3	380,293	52.0	1,507,561	61.4
Russia:							
In Europe	1897	13,808,505	59.6	1,974,164	38.0	15,782,669	55.6
In Asia	1897	2,092,965	69.2	105,137	30.5	2,198,102	65.3
Total	1897	15,901,470	60.7	2,079,301	37.5	17,980,771	56.7
St. Lucia	1901	....	....	....	....	15,796	54.1
Serbia	1900	311,700	65.5	13,524	50.5	325,224	64.7
Sierra Leone	1901	8,705	28.7	4,544	21.7	13,249	25.9
Spain	1900	3,741,730	58.1	775,270	51.8	4,517,000	56.9
Sweden	1900	761,016	52.4	333,264	53.8	1,094,280	52.8
Switzerland	1900	392,971	37.1	80,326	16.1	473,297	30.4
Trinidad and Tobago	1901	51,744	54.7	25,765	39.3	77,509	48.4
Union of South Africa	1904	863,223	56.3	847,057	77.5	1,710,280	65.1
United Kingdom	1901	2,109,812	16.3	152,642	2.9	2,262,454	12.4

AGRICULTURAL LAND.

TABLE 332.—*Total area and agricultural land in various countries.*

[As classified and reported by the International Institute of Agriculture.]

Country.	Year.	Total area.	Productive land.[1] Amount.	Productive land.[1] Per cent of total area.	Cultivated land.[2] Amount.	Cultivated land.[2] Per cent of total area.
NORTH AMERICA.		*Acres.*	*Acres.*	*Per cent.*	*Acres.*	*Per cent.*
United States	1910	1,903,269,000	878,789,000	46.2	293,794,000	15.4
Canada	1901	2,397,082,000	63,420,000	2.6	19,880,000	.8
Costa Rica	1909–10	13,343,000	3,090,000	23.2	442,000	3.3
Cuba	1899	28,299,000	8,717,000	30.8	778,000	2.7
SOUTH AMERICA.						
Argentina	1909–10	729,575,000	537,805,000	73.7	44,446,000	6.1
Chile [3]	1910–11	187,145,000	15,144,000	8.1	2,557,000	1.4
Uruguay	1908	46,189,000	40,875,000	88.5	1,962,000	4.2
EUROPE.						
Austria-Hungary:						
Austria	1911	74,132,000	69,939,000	94.3	26,272,000	35.4
Hungary	1910	80,272,000	77,225,000	96.2	35,178,000	43.8
Total Austria-Hungary		154,404,000	147,164,000	95.3	61,450,000	39.8
Belgium	1895	7,278,000	6,443,000	88.5	3,582,000	49.2
Bulgaria	1910	23,807,000	18,959,000	79.6	8,574,000	36.0
Denmark	1907	9,629,000	9,078,000	94.3	6,376,000	66.2
Finland	1901	82,113,000			3,875,000	4.7
France	1910	130,854,000	123,642,000	94.5	59,124,000	45.2
Germany	1900	133,594,000	126,401,000	94.6	63,689,000	47.7
Italy	1911	70,839,000	65,164,000	92.0	33,815,000	47.7
Luxemburg	1911	639,000	616,000	96.4	300,000	46.9
Netherlands	1911	8,057,000	7,258,000	90.1	2,210,000	27.4
Norway	1907	79,810,000	22,942,000	28.7	1,830,000	2.3
Portugal	1912	22,018,000	17,281,000	78.5	5,777,000	26.2
Roumania	1905	32,167,000	24,645,000	76.6	14,829,000	46.1
Russia, European	1911	1,278,203,000	698,902,000	54.7	245,755,000	19.2
Serbia	1897	11,936,000	6,246,000	52.3	2,534,000	21.2
Spain	1908–1911	124,666,000	112,665,000	90.4	41,264,000	33.1
Sweden	1911	110,667,000	65,196,000	58.9	9,144,000	5.9
Switzerland [4]	1905	10,211,000	7,635,000	74.8	605,000	8.3
United Kingdom:						
Great Britain	1911	56,802,000	47,737,000	84.0	14,587,000	25.7
Ireland	1911	20,350,000	18,789,000	92.3	3,275,000	16.1
Total United Kingdom		77,152,000	66,526,000	86.2	17,862,000	23.2
ASIA.						
British India	1910–11	615,695,000	465,706,000	75.6	264,858,000	43.0
Formosa	1911	8,858,000	1,972,000	22.3	1,884,000	21.3
Japan	1911	94,495,000	74,180,000	78.5	17,639,000	18.7
Russia, Asiatic	1911	4,028,001,000	715,838,000	17.8	33,860,000	.8
AFRICA.						
Algeria	1910	124,976,000	50,816,000	40.7	11,434,000	9.1
Egypt	1912	222,390,000	5,486,000	2.5	5,457,000	2.5
Tunis	1912	30,888,000	22,239,000	72.0	6,919,000	22.4
Union of South Africa	1909–10	302,827,000	3,569,000	1.2	3,385,000	1.1
OCEANIA.						
Australia	1910–11	1,903,664,000	119,942,000	6.3	14,987,000	.8
New Zealand	1910	66,469,000	57,310,000	86.2	6,955,000	10.5
Total, 36 countries		15,071,209,000	4,591,691,000	30.5	1,313,832,000	8.7

[1] Includes, besides cultivated land, also natural meadows and pastures, forests, wood lots, and lands devoted to cultivated trees and shrubs.
[2] Includes fallow lands; also artificial grasslands.
[3] The figure for "productive land" in Chile excludes marshes, heaths, and productive but uncared-for lands.
[4] The figure for "cultivated land" in Switzerland excludes artificial meadows and pastures.

NATIONAL FORESTS.

TABLE 333.—*National Forests: Timber disposed of, quantity, price, and number of users, revenue under specified heads, and details of grazing privileges, years ended June 30, 1916 to 1920.*

[Reported by the Forest Service.]

Item.	Year ended June 30— 1916	1917	1918	1919	1920
Free timber given:					
Number of users	42,055	41,427	38,073	34,617	37,336
Timber cut ... M ft.	119,483	113,073	98,376	90,798	88,060
Value ... dollars	184,715	149,802	128,866	113,117	113,009
Timber sales:					
Number	10,840	11,608	13,037	12,592	13,272
Quantity ... M ft.	906,906	2,008,087	1,453,299	799,476	1,326,922
Price per thousand board feet (average) ... dollars	1.98	1.85	2.28	2.30	2.30
Grazing:					
Number of permits	33,328	36,638	39,113	39,152	37,500
Kinds of stock—					
Cattle ... number	1,758,764	1,953,198	2,137,854	2,135,527	2,033,800
Goats ... do	43,268	49,939	57,968	60,789	53,685
Hogs ... do	2,968	2,306	3,371	5,154	4,066
Horses ... do	98,903	98,880	102,156	93,251	83,015
Sheep ... do	7,843,205	7,586,034	8,454,240	7,935,174	7,271,136
Total	9,747,108	9,690,357	10,755,589	10,229,895	9,445,702
Special use and water-power permits, Number	5,251	6,056	5,819	5,191	6,026
Revenue from—					
Timber sales ... dollars	1,367,111	1,595,873	1,519,867	1,503,367	1,999,668
Timber settlements [1] ... do	2,299	17,102	99,502	8,939	11,835
Timber trespass ... do	37,712	18,870	2,330	8,623	13,787
Turpentine sales ... do	14,402	8,156	8,334	13,220	19,310
Turpentine trespass ... do	....	....	....	692	....
Fire trespass ... do	5,471	52,514	3,618	5,259	22,796
Occupancy trespass ... do	....	....	1,207	689	943
Special uses ... do	85,235	108,329	119,979	136,134	149,265
Grazing fees ... do	1,202,405	1,544,714	[2] 1,702,585	2,556,962	2,427,028
Grazing trespass ... do	7,810	5,081	23,532	52,208	59,012
Water power ... do	101,096	106,389	93,976	72,322	89,838
Total revenue ... do	2,823,541	3,457,028	3,574,930	4,358,415	4,793,482

[1] Includes timber taken in the exercise of permits for rights of way, development of power, etc.
[2] Includes $296 from sale of live stock.

NATIONAL FORESTS—Continued.

TABLE 334.—*Area of National Forest lands, June 30, 1920.*

[Reported by the Forest Service.]

State and forest.	Net area.
	Acres.
Alabama:	
Alabama	49,561
Alaska:	
Chugach	5,130,201
Tongass	15,449,539
Total	20,579,740
Arizona:	
Apache	1,248,142
Coconino	1,771,971
Coronado[1]	1,304,883
Crook	892,487
Dixie[1]	17,680
Kaibab	752,339
Prescott	1,447,350
Sitgreaves	650,350
Tonto	1,988,806
Tusayan	1,298,119
Total	11,367,632
Arkansas:	
Arkansas	633,277
Ozark	282,372
Total	915,649
California:	
Angeles	817,441
California	817,151
Cleveland	548,181
Crater[1]	47,097
Eldarado[1]	553,318
Inyo[1]	1,204,221
Klamath[1]	1,524,514
Lassen	936,957
Modoc	1,187,226
Mono[1]	785,701
Plumas	1,144,418
Santa Barbara	2,011,942
Sequoia	1,879,660
Shasta	818,529
Sierra	1,493,400
Siskiyou[1]	348,919
Stanislaus	810,802
Tahoe[1]	531,210
Trinity	1,430,474
Total	18,891,161
Colorado:	
Arapahoe	634,485
Battlement	653,583
Cochetopa	904,810
Colorado	851,960
Durango	620,485
Gunnison	905,729
Hayden[1]	66,053
Holy Cross	575,463
La Sal[1]	27,444
Leadville	928,014
Montezuma	699,684
Pike	1,077,363
Rio Grande	1,135,589
Routt	744,261
San Isabel	598,912
San Juan	619,683
Sopris	596,578
Uncompahgre	788,496
White River	845,595
Total	13,274,187
Florida:	
Florida	308,408
Georgia:	
Cherokee[1]	60,234
Nantahala[1]	47,511
Total	107,745
Idaho:	
Boise	1,060,006
Cache[1]	493,272
Caribou[1]	670,170
Challis	1,257,537
Clearwater	785,376
Coeur d'Alene	663,713
Idaho	1,879,560
Kaniksu[1]	197,476
Lemhi	1,095,924
Minidoka[1]	509,084
Nez Perce	1,626,627
Payette	1,197,799
Pend Oreille	675,034
St. Joe	556,354
Salmon	1,620,749
Sawtooth	1,159,660
Selway	1,688,287
Targhee[1]	983,731
Weiser	561,672
Total	18,682,031
Maine:	
White Mountain[1]	27,860
Michigan:	
Michigan	89,466
Minnesota:	
Minnesota	190,602
Superior	856,142
Total	1,046,744
Montana:	
Absaroka	841,079
Beartooth	662,136
Beaverhead	1,346,025
Bitterroot	1,047,459
Blackfeet	902,498
Cabinet	829,284
Custer[1]	518,033
Deerlodge	830,935
Flathead	1,716,789
Gallatin	567,614
Helena	680,257
Jefferson	1,042,884
Kootenai	1,333,461
Lewis and Clark	810,891
Lolo	850,677
Madison	931,645
Missoula	1,031,154
Total	15,942,821
Nebraska:	
Nebraska	205,944
Nevada:	
Dixie[1]	56,324
Eldorado[1]	400
Humboldt	1,311,584
Inyo[1]	56,365
Mono[1]	464,316
Nevada	1,174,748
Tahoe[1]	13,853
Toiyabe	1,907,476
Total	4,985,066

[1] For total area, see Table 335, "National Forests extending into two or more States."

NATIONAL FORESTS—Continued.

TABLE 334.—*Area of National Forest lands, June 30, 1920*—Continued.

State and forest.	Net area.
	Acres.
New Hampshire:	
White Mountain[1]	355,472
New Mexico:	
Carson	862,565
Coronado[1]	126,318
Datil	2,670,805
Gila	1,461,231
Lincoln	1,124,036
Manzano	697,488
Santa Fe	1,365,991
Total	8,308,434
North Carolina:	
Boone	95,394
Cherokee[1]	....
Nantahala[1]	72,255
Pisgah	91,463
Total	259,112
Oklahoma:	
Wichita	61,480
Oregon:	
Cascade	1,020,526
Crater[1]	802,128
Deschutes	1,282,012
Fremont	849,526
Klamath[1]	8,723
Malheur	1,043,895
Ochoco	715,740
Oregon	1,046,693
Santiam	607,097
Siskiyou[1]	997,865
Siuslaw	543,290
Umatilla	485,786
Umpqua	1,010,633
Wallowa	957,379
Wenaha[1]	425,280
Whitman	1,315,445
Total	13,111,928
Porto Rico:	
Luquillo	12,443
South Carolina:	
Nantahala[1]	18,454
South Dakota:	
Black Hills[1]	476,890
Custer[1]	73,171
Harney	535,610
Total	1,085,671
Tennessee:	
Cherokee[1]	113,724
Utah:	
Ashley[1]	974,229
Cache[1]	268,501
Utah—Continued.	
Dixie[1]	435,270
Fillmore	700,744
Fishlake	657,048
La Sal[1]	509,605
Manti	781,616
Minidoka[1]	69,224
Powell	686,343
Sevier	720,350
Uinta	1,005,983
Wasatch	605,783
Total	7,414,696
Virginia:	
Monongahela[1]	....
Natural Bridge	87,166
Shenandoah[1]	222,345
Total	310,611
Washington:	
Chelan	677,592
Columbia	784,627
Colville	754,737
Kaniksu[1]	257,607
Okanogan	1,488,457
Olympic	1,534,172
Ranier	1,316,364
Snoqualmie	696,071
Washington	1,459,789
Wenaha[1]	313,439
Wenatchie	657,034
Total	9,939,889
West Virginia:	
Monongahela[1]	53,335
Shenandoah[1]	45,192
Total	98,527
Wyoming:	
Ashley[1]	5,987
Bighorn	1,124,617
Black Hills[1]	144,346
Bridger	713,609
Caribou[1]	6,284
Hayden[1]	327,356
Medicine Bow	478,078
Shoshone	1,579,084
Targhee[1]	337,666
Teton	1,924,241
Washakie	852,315
Wyoming	974,614
Total	8,468,197
Total, National Forests	156,032,053
Appalachian area[2]	109,154
Grand total	156,141,207

[1] For total area, see Table 335: "National Forests extending into two or more States."
[2] Acquired under the Weeks law.

NATIONAL FORESTS—Continued.

TABLE 335.—*National Forests extending into two or more States.*

Forest.	States.	Net area.
		Acres.
Coronado	Arizona-New Mexico	1,431,206
Dixie	Arizona-Nevada-Utah	509,274
Crater	California-Oregon	849,225
Eldorado	California-Nevada	553,718
Inyo	do	1,260,586
Klamath	California-Oregon	1,533,237
Mono	California-Nevada	1,250,017
Siskiyou	California-Oregon	1,346,784
Tahoe	California-Nevada	545,063
Hayden	Colorado-Wyoming	393,409
La Sal	Colorado-Utah	537,049
Cache	Idaho-Utah	761,773
Caribou	Idaho-Wyoming	676,454
Kaniksu	Idaho-Washington	455,083
Minidoka	Idaho-Utah	578,308
Targhee	Idaho-Wyoming	1,321,397
Custer	Montana-South Dakota	591,204
Wenaha	Oregon-Washington	738,719
Black Hills	South Dakota-Wyoming	621,236
Ashley	Utah-Wyoming	980,216
White Mountain	Maine-New Hampshire	383,332
Shenandoah	Virginia-West Virginia	268,037
Cherokee	Georgia-North Carolina-Tennessee	173,958
Monongahela	Virginia-West Virginia	53,335
Nantahala	Georgia-North Carolina-South Carolina	138,220

TABLE 336.—*Grazing allowances for National Forests, 1920.*

[Reported by the Forest Service. The symbols (+) or (−) indicate, respectively, that there was an increase or decrease in 1919 compared with 1918. The figures themselves refer to actual numbers of stock authorized in 1919.]

Forest.	Number of stock authorized.			Yearlong rates (cents).			
	Cattle and horses.	Swine.	Sheep and goats.	Cattle.	Horses.	Swine.	Sheep and goats.
District 1:							
Absaroka	− 7,500	....	− 70,000	100	125	75	25
Beartooth [1]	+ 5,300	....	− 43,350	100	125	75	25
Beaverhead [1]	− 26,775	....	− 120,700	100	125	75	25
Bitterroot	4,500	....	− 66,000	100	125	75	25
Blackfeet	1,500	....	− 15,000	80	100	60	20
Cabinet	2,400	....	25,000	80	100	60	20
Clearwater	− 250	....	+ 50,000	80	100	60	20
Coeur d'Alene	1,000	....	20,000	80	100	60	20
Custer-Sioux [3,4]	− 28,650	....	− 5,550	120	150	90	30
Deerlodge [1]	17,580	....	51,800	100	125	75	25
Flathead	1,200	....	+ 5,000	80	100	60	20
Gallatin	+ 6,240	....	− 45,100	120	150	90	30
Helena	− 18,250	....	− 58,500	100	125	75	25
Jefferson [1]	+ 22,700	....	+ 124,100	100	125	75	25
Kaniksu	650	....	+ 14,000	80	100	60	20
Kootenai	+ 3,650	....	+ 35,200	80	100	60	20
Lewis and Clark	− 9,650	....	− 41,200	100	125	75	25
Lolo	1,000	....	+ 51,000	80	100	60	20
Madison [1]	− 29,250	....	− 135,000	120	150	90	30
Missoula	− 9,550	....	− 8,000	100	125	75	25
Nez Perce	− 12,825	....	− 94,100	120	150	90	30
Pend Oreille	− 820	....	− 25,600	80	100	60	20
Selway	− 3,390	....	+ 52,000	80	100	60	20
St. Joe	400	....	32,000	80	100	60	20
	215,030	....	1,188,200	....	....	....	....
District 2:							
Arapaho [1]	+ 13,000	....	28,500	100	125	75	25
Battlement [4]	+ 49,250	....	10,000	100	125	75	25
Bighorn [1]	+ 47,535	....	− 126,100	120	150	90	30
Black Hill [4]	+ 31,035	....	7,450	100	125	75	25
Cochetopa [1]	+ 20,850	....	+ 76,100	100	125	75	25
Colorado	− 22,200	....	+ 11,500	100	125	75	25

[1] 5-year permits authorized for cattle and horses and sheep and goats.
[3] Fees on Sioux division are on basis of $1 per year for cattle.
[4] 5-year permits authorized for cattle.

NATIONAL FORESTS—Continued.

TABLE 336.—*Grazing allowances for National Forests, 1920*—Continued.

Forest.	Number of stock authorized.			Yearlong rates (cents).			
	Cattle and horses.	Swine.	Sheep and goats.	Cattle.	Horses.	Swine.	Sheep and goats.
District 2—Continued.							
Durango [1]	+ 13,775		− 95,500	100	125	75	25
Gunnison [1]	+ 38,025		+ 51,750	100	125	75	25
Harney [3]	+ 14,950			100	125	75	25
Hayden [2]	7,400		− 141,200	100	125	75	25
Holy Cross-Sopris [1]	− 26,205		− 93,370	100	125	75	25
Leadville [1]	− 12,600		+ 110,000	100	125	75	25
Medicine Bow [1]	− 11,650		− 55,900	100	125	75	25
Michigan	1,250		3,300	100	125	75	25
Minnesota	2,000			100	125	75	25
Montezuma [1]	− 36,720	+ 100	− 51,150	100	125	75	25
Nebraska	+ 15,500			150	187	112.5	37.5
Pike [1]	− 19,300		24,500	100	125	75	25
Rio Grande [1]	− 24,100		284,000	100	125	75	25
Routt [2]	+ 30,650		− 88,520	100	125	75	25
San Isabel [1]	+ 16,100		+ 21,800	100	125	75	25
San Juan [1]	13,320	1,000	102,900	100	125	75	25
Shoshone [1]	+ 14,650		+ 78,000	100	125	75	25
Uncompahgre [1]	+ 34,750		− 57,250	100	125	75	25
Washakie [1]	+ 13,150		+ 52,200	100	125	75	25
White River [1]	+ 42,800		+ 42,000	100	125	75	25
	572,765	1,100	1,612,990				
District 3:							
Apache [1]	− 47,000	180	− 55,500	100	125	75	25
Carson [2]	+ 11,950	200	+ 155,350	100	125	75	25
Coconino [1]	− 47,000	100	94,000	100	125	75	25
Coronado [3]	+ 55,000	+ 300	− 8,800	100	125	75	25
Crook [3]	+ 32,600	+ 115	+ 4,900	100	125	75	25
Datil [1]	56,000	225	147,000	100	125	75	25
Gila [1]	− 57,600	+ 475	13,100	100	125	75	25
Lincoln [1]	+ 34,000	− 200	− 23,600	100	125	75	25
Manzano [1]	+ 12,000		− 76,000	100	125	75	25
Prescott [1]	+ 69,400	100	68,500	100	125	75	25
Santa Fe [1]	18,000	400	121,000	100	125	75	25
Sitgreaves [2]	− 9,000	+ 400	− 58,500	100	125	75	25
Tonto [3]	− 63,300	500	100	100	125	75	25
Tusayan [1]	28,900	160	75,200	100	125	75	25
	541,750	3,355	901,550				
District 4:							
Ashley [1]	11,000		100,000	100	125	75	25
Boise [1]	+ 6,050		− 137,000	120	150	90	30
Bridger [1]	+ 33,100		− 65,000	120	150	90	30
Cache [1]	− 29,200		− 127,800	120	150	90	30
Caribou [1]	− 23,200		− 279,000	120	150	90	30
Challis [1]	− 9,000		− 88,000	100	125	75	25
Dixie-Sevier [1]	+ 16,100	400	− 80,900	100	125	75	25
Fillmore	− 19,700	500	− 30,000	120	150	90	30
Fishlake [2]	− 18,200		− 64,400	120	150	90	30
Humboldt	− 54,300		− 283,000	120	150	90	30
Idaho [1]	+ 2,200		+ 132,000	120	150	90	30
Kaibab	− 8,100		5,000	100	125	75	25
La Sal [1]	− 24,000	+ 200	− 35,000	100	125	75	25
Lemhi [1]	− 17,700		+ 69,500	120	150	90	30
Manti	22,600		− 128,000	120	150	90	30
Minidoka [1]	− 23,400		+ 79,400	120	150	90	30
Nevada [1]	+ 6,500		− 48,000	100	125	75	25
Payette [1]	+ 12,600		+ 117,500	120	150	90	30
Powell-Sevier [1]	+ 18,600		+ 106,000	100	125	75	25
Salmon [1]	− 14,500		− 86,000	100	125	75	25
Sawtooth [1]	11,200		− 260,000	120	150	90	30
Targhee [1]	+ 36,400		234,000	120	150	90	30
Teton	+ 13,250		20,000	120	150	90	30
Toiyabe [1]	− 23,000		+ 24,200	100	125	75	25
Uinta [1]	− 38,500		194,000	120	150	90	30
Wasatch [1]	− 13,000		+ 61,500	120	150	90	30
Weiser [1]	− 12,600		− 62,000	120	150	90	30
Wyoming [1]	+ 14,800		− 219,000	120	150	90	30
	532,800	1,100	3,136,200				

[1] 5-year permits authorized for cattle and horses and sheep and goats.
[2] 5-year permits authorized for sheep.
[3] 5-year permits authorized for cattle.

NATIONAL FORESTS—Continued.

TABLE 336.—*Grazing allowances for National Forests, 1920*—Continued.

Forest.	Number of stock authorized.			Yearlong rates (cents).			
	Cattle and horses.	Swine.	Sheep and goats.	Cattle.	Horses.	Swine.	Sheep and goats.
District 5:							
Angeles [3]	4,100	....	....	120	150	90	30
California [1]	− 7,850	500	50,000	120	150	90	30
Cleveland [1]	1,800	....	4,800	120	150	90	30
Eldorado [1]	11,725	....	21,200	140	175	105	35
Inyo [1]	+ 8,675	....	− 49,200	140	175	105	35
Klamath [1]	10,250	1,150	32,000	100	125	75	25
Lassen [1]	+ 14,200	+ 500	42,000	120	150	90	30
Modoc [1]	− 39,100	....	− 57,250	120	150	90	30
Mono [1]	+ 6,000	....	+ 87,000	140	175	105	35
Plumas [1]	− 15,800	....	− 87,800	140	175	105	35
Santa Barbara [1]	+ 10,675	300	+ 15,500	120	150	90	30
Sequoia [3]	− 29,600	600	− 5,200	140	175	105	35
Shasta [1]	12,500	200	+ 37,000	120	150	90	30
Sierra [1]	− 17,640	1,300	− 46,200	140	175	105	35
Stanislaus [1]	+ 20,700	+ 500	+ 19,300	140	175	105	35
Tahoe [1]	+ 10,900	50	55,000	140	175	105	35
Trinity [1]	13,050	− 400	− 23,100	100	125	75	25
	234,565	5,500	632,550	....	....	....	....
District 6:							
Cascade [1]	− 1,020	....	− 16,700	120	150	90	30
Chelan [2]	550	....	− 33,000	120	150	90	30
Columbia [1]	+ 1,500	....	+ 17,600	120	150	90	30
Colville [1]	+ 8,500	....	50,000	120	150	90	30
Crater [1]	− 16,000	....	− 19,250	120	150	90	30
Deschutes [1]	+ 10,300	....	− 22,100	120	150	90	30
Fremont [1]	− 12,500	....	− 94,000	120	150	90	30
Malheur [1]	32,000	....	− 100,000	120	150	90	30
Minam [1]	+ 15,100	....	− 69,000	120	150	90	30
Ochoco [1]	+ 20,300	....	+ 87,000	120	150	90	30
Okanogan [1]	+ 16,300	....	− 41,600	120	150	90	30
Olympic	2,500	....	+ 1,000	100	125	75	25
Oregon [1]	+ 4,650	....	+ 26,140	100	150	90	30
Rainier [1]	7,700	....	− 56,000	120	150	90	30
Santiam [1]	− 300	....	− 18,000	120	150	90	30
Siskiyou	+ 4,500	− 950	+ 7,750	100	125	75	25
Siuslaw	− 1,450	....	7,000	100	125	75	25
Snoqualmie	....	....	7,200	120	150	90	30
Umatilla [1]	− 10,000	....	− 55,000	120	150	90	30
Umpqua [1]	1,400	....	− 7,400	120	150	90	30
Wallowa [1]	− 25,300	....	− 60,600	120	150	90	30
Washington	250	....	5,000	100	125	75	25
Wenaha [1]	− 12,600	....	− 97,000	120	150	90	30
Wenatchee [2]	950	....	66,000	120	150	90	30
Whitman [1]	− 11,900	....	− 104,300	120	150	90	30
	217,570	950	1,068,640	....	....	....	....
District 7:							
Arkansas	30,000	22,000	2,000	80	100	60	20
Florida	6,000	3,000	7,000	80	100	60	20
Ozark	7,890	9,865	1,972	80	100	60	20
Wichita	4,710	....	....	150	187	112.5	37.5
	48,600	34,865	10,972	....	....	....	....
Purchase areas:							
Alabama	+ 260	....	....	150	200	90	45
Cherokee-Georgia	3,800	1,200	1,000	150	200	90	45
Monongahela	400	40	100	150	200	90	45
Natural Bridge	400	....	....	150	200	90	45
Pisgah-Boone	+ 1,000	100	550	150	200	90	45
Shenandoah	+ 2,838	100	750	150	200	90	45
White Mountain	+ 150	....	....	150	200	90	45
White Top	1,000	450	350	150	200	90	45
Nantahala	710	560	430	150	200	90	45
	10,558	2,450	3,180	....	....	....	....
Totals, 1913	1,852,999	59,535	8,521,308	....	....	....	....
Totals, 1914	1,891,119	65,645	8,867,906	....	....	....	....
Totals, 1915	1,983,775	64,040	8,747,025	....	....	....	....
Totals, 1916	2,008,675	58,990	8,597,689	....	....	....	....
Totals, 1917	2,120,145	54,680	8,400,155	....	....	....	....
Totals, 1918	2,359,402	51,685	8,937,837	....	....	....	....
Totals, 1919	2,388,975	48,885	8,845,607	....	....	....	....
Totals, 1920	2,373,638	49,320	8,554,282	....	....	....	....
Increase or decrease in 1920 over 1919	− 15,337	+ 435	− 291,325	....	....	....	....

[1] 5-year permits authorized for cattle and horses and sheep and goats.
[2] 5-year permits authorized for sheep.
[3] 5-year permits authorized for cattle.

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