

DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
SAM. L. ROGERS, DIRECTOR

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BULLETIN 134

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COTTON PRODUCTION  
AND  
DISTRIBUTION

SEASON OF 1915-16



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1916

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## LETTER OF TRANSMITTAL.

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DEPARTMENT OF COMMERCE,  
BUREAU OF THE CENSUS,  
*Washington, D. C., September 20, 1916.*

SIR:

I have the honor to transmit herewith Census Bulletin 134, which is a report on the production of cotton from the crop of 1915 and the consumption, imports, exports, and stocks of cotton and number of cotton spindles for the year ending July 31, 1916. The statistics were collected and compiled by this bureau under the supervision of William M. Steuart, chief statistician for manufactures, assisted by H. J. Zimmerman.

The report is presented in seven sections: (1) Supply and distribution of cotton in the United States; (2) annual production of cotton and linters in the United States, as returned by ginner and delinters, distributed by states and counties, from 1911 to 1915, inclusive, with production for previous years; (3) consumption and stocks of cotton and number of cotton spindles in the United States for the year ending July 31, 1916, together with detailed statistics of spindles, cotton consumed, and cotton on hand, including comparative figures for previous years; (4) imports and exports of cotton for the year ending July 31, 1916, with comparative figures for previous years, and imports and exports of cotton goods; (5) world's cotton production, by countries; (6) the world's spindles and consumption of cotton; and (7) the manufacture of cottonseed products as returned at the census of manufactures covering the season of 1913-14, and cotton seed crushed and linters produced to specified dates during the season of 1915-16.

In conformity with the act of Congress approved July 22, 1912, there were published, during the season of 1915-16, ten preliminary reports of cotton ginned to specified dates and twelve reports giving for each month statistics of the quantity of cotton and linters consumed, the quantity on hand in consuming establishments and in public storage and at compresses, the quantity imported, the quantity exported, and the number of active consuming cotton spindles. The statistics of imports show the countries of production, and those of exports the principal countries to which exported. The present report gives the aggregation of the facts included in the preliminary statements, and covers, respectively, the seventeenth and twelfth consecutive years for which statistics of cotton ginned and of cotton consumed and cotton stocks have been collected and published by this bureau. Four reports of cotton seed crushed and linters produced were also collected as follows: To December 1, to January 1, to March 1, and for the season.

The act of Congress approved August 7, 1916, provides for the collection of monthly reports from the cottonseed-oil mills on seed received, crushed, and on hand, and on products manufactured, shipped, and on hand, and from refiners, brokers, exporters, and consumers on stocks of crude and refined cottonseed oil on hand; also for quarterly reports on raw and prepared cotton fiber used in the manufacture of guncotton and explosives of all kinds, and of absorbent and medicated cotton. The reports on cotton to be issued during the season of 1916-17 will accordingly cover these inquiries, in addition to those covered in the reports published during the past season.

Respectfully,

SAM. L. ROGERS,  
*Director of the Census.*

To HON. WILLIAM C. REDFIELD,  
*Secretary of Commerce.*

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# SUPPLY AND DISTRIBUTION OF COTTON IN THE UNITED STATES.

Table 1 summarizes the statistics for the supply and distribution of cotton and of linters in the United States for the 12 months ending July 31, 1915 and 1916. Detailed figures for the various items making up the supply and distribution are presented in the tables appearing elsewhere in the report.

**TABLE 1.—SUPPLY AND DISTRIBUTION OF COTTON AND OF LINTERS IN THE UNITED STATES FOR THE 12 MONTHS ENDING JULY 31: 1915 AND 1916.**

[Quantities are given in running bales, except that round bales are counted as half bales and foreign cotton in equivalent 500-pound bales.]

	TOTAL (BALES).		COTTON EXCLUSIVE OF LINTERS (BALES).		LINTERS (BALES).	
	1916	1915	1916	1915	1916	1915
<b>SUPPLY.</b>						
Aggregate.....	16, 972, 895	18, 913, 660	15, 527, 994	17, 891, 154	1, 444, 901	1, 022, 506
On hand at beginning of year.....	4, 324, 890	1, 547, 448	3, 936, 104	1, 365, 864	388, 786	181, 584
In consuming establishments.....	1, 600, 090	989, 980	1, 401, 185	905, 762	198, 905	84, 218
In cotton-growing states.....	673, 731	347, 664	577, 201	326, 953	96, 530	20, 711
In all other states.....	926, 359	642, 316	823, 984	578, 809	102, 375	63, 507
In public storage and at compresses.....	1, 874, 800	457, 468	1, 784, 919	425, 102	89, 881	32, 366
Elsewhere (estimated).....	850, 000	100, 000	750, 000	35, 000	100, 000	65, 000
Net imports.....	420, 995	363, 595	420, 995	363, 595	(1)	(1)
Ginnings.....	12, 012, 813	16, 738, 241	11, 068, 173	15, 905, 840	944, 640	832, 401
To balance distribution.....	214, 197	264, 376	102, 722	255, 855	111, 475	8, 521
<b>DISTRIBUTION.</b>						
Aggregate.....	16, 972, 895	18, 913, 660	15, 527, 994	17, 891, 154	1, 444, 901	1, 022, 506
Exported.....	6, 191, 110	8, 544, 563	5, 895, 672	8, 322, 688	295, 438	221, 875
Consumed.....	7, 278, 529	6, 009, 207	6, 397, 613	5, 597, 362	880, 916	411, 845
In cotton-growing states.....	3, 977, 130	3, 193, 353	3, 527, 528	3, 026, 969	449, 602	166, 384
In all other states.....	3, 301, 399	2, 815, 854	2, 870, 085	2, 570, 393	431, 314	245, 461
Destroyed by fire.....	100, 000	35, 000	95, 000	35, 000	5, 000	.....
On hand at end of year.....	3, 403, 256	4, 324, 890	3, 139, 709	3, 936, 104	263, 547	388, 786
In consuming establishments.....	1, 732, 686	1, 600, 090	1, 632, 245	1, 401, 185	100, 441	198, 905
In cotton-growing states.....	718, 117	673, 731	684, 654	577, 201	33, 463	96, 530
In all other states.....	1, 014, 569	926, 359	947, 591	823, 984	66, 978	102, 375
In public storage and at compresses.....	1, 220, 570	1, 874, 800	1, 107, 464	1, 784, 919	113, 106	89, 881
Elsewhere (estimated).....	450, 000	850, 000	400, 000	750, 000	50, 000	100, 000

1 Included in statistics of cotton imported.

The supply of cotton in the United States for the year ending July 31, 1916, amounted to 15,527,994 bales, and of linters to 1,444,901 bales, making a total for cotton and linters combined of 16,972,895 bales. This total compares with 18,913,660 bales in 1915, which included the record crop of 1914. The extent of the supply for any season of course depends almost entirely upon the ginnings during the year, this item being the most important one in making up the total. As a result, the differences in the supply of cotton practically represent the differences in the size of the crops produced in the United States, since stocks carried forward and the net imports are too small, as a rule, to affect the totals materially.

Of the total supply of cotton for 1916, 6,492,613 bales, or 41.8 per cent, including the quantity destroyed by fire, were consumed in this country; 5,895,672 bales, or 38 per cent, were exported; and 3,139,709 bales, or 20.2 per cent, remained in the

country at the close of the year. Of the linter supply, 885,916 bales were consumed in this country, 295,438 bales exported, and 263,547 bales held in the country at the close of the year. The mill consumption of cotton and of linters in the United States in 1916 was the largest in the history of the country, exceeding that for 1915, the next largest, by 800,251 bales of cotton and 469,071 bales of linters. The exports, while large, have been exceeded by those of a number of other years.

Stocks of cotton in the United States at the close of July, 1916, amounted to 3,139,709 bales, and of linters to 263,547 bales, a total of 3,403,256 bales. This amount was exceeded by the quantity held on July 31, 1915, following the large crop of 1914 and the reduced foreign movement due to the European war. Cotton held in consuming establishments amounted to 1,632,245 bales, which compares with 1,401,185 bales for the preceding year. On the basis of the

consumption during the past year, the stocks held in consuming establishments July 31, 1916, represent about a three-months' supply for the American mills.

## COMPARATIVE DATA.

Formerly statistics of linters were included with those of cotton in making up the figures for the supply

and distribution, and only since September 1, 1913, have data of linters exported been available, thus permitting the presentation of complete statistics of lint cotton separately. Table 2, which gives comparative statistics for the supply and distribution of cotton since the inauguration of these reports by the Bureau of the Census, necessarily combines the data for cotton and linters.

TABLE 2.—SUPPLY AND DISTRIBUTION OF COTTON AND LINTERS IN THE UNITED STATES: 1906 TO 1916.

[The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31. Quantities are given in running bales except that round bales are counted as half bales and foreign cotton in equivalent 500-pound bales.]

	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906
<b>SUPPLY.</b>											
Aggregate.....	16,972,895	18,913,660	16,492,408	16,275,734	17,896,226	13,873,423	12,188,021	15,312,885	13,358,707	15,025,720	13,047,219
On hand at beginning of year, total.....	4,324,890	1,547,448	1,648,438	1,776,885	1,375,031	1,040,040	1,483,585	1,236,058	1,514,567	1,349,139	1,934,548
In consuming establishments, total.....	1,600,090	989,980	778,158	870,640	642,191	553,232	907,097	594,184	1,010,738	680,471	776,801
In cotton-growing states.....	673,731	347,664	234,509	241,611	101,114	121,349	186,458	112,471	311,307	184,000	232,928
In all other states.....	926,359	642,316	543,649	629,035	441,077	411,883	720,639	481,713	705,431	496,411	543,873
In public storage and at compresses.....	1,874,890	457,468	495,280	558,239	432,840	308,808	325,099	444,020	388,919	668,668	1,157,747
Elsewhere (estimated).....	850,000	100,000	375,000	350,000	400,000	200,000	251,389	197,248	108,910		
Net imports.....	420,995	303,595	265,646	225,460	229,268	231,191	151,395	165,451	140,869	202,733	133,464
Ginnings.....	12,012,813	16,738,241	14,290,320	14,159,078	16,068,936	12,384,248	10,350,978	13,418,144	11,527,833	13,097,992	10,656,498
To balance distribution.....	214,197	264,376	288,004	114,311	222,991	217,944	202,063	493,232	175,438	375,836	322,700
<b>DISTRIBUTION.</b>											
Aggregate.....	16,972,895	18,913,660	16,492,408	16,275,734	17,896,226	13,873,423	12,188,021	15,312,885	13,358,707	15,025,720	13,047,219
Exported.....	6,191,110	8,544,563	8,914,839	8,800,966	10,681,758	7,781,414	6,339,028	8,574,024	7,573,349	8,503,265	6,763,041
Consumed, total.....	7,278,529	6,009,207	5,884,733	5,786,330	5,367,583	4,704,978	4,798,953	5,240,719	4,539,090	4,984,936	4,909,279
In cotton-growing states.....	3,977,130	3,193,353	3,023,415	2,960,518	2,712,223	2,328,487	2,292,333	2,553,797	2,187,090	2,410,908	2,373,577
In all other states.....	3,301,399	2,815,854	2,861,318	2,825,812	2,655,360	2,376,491	2,506,620	2,686,922	2,351,994	2,573,943	2,535,702
Destroyed by fire.....	100,000	35,000	45,000	40,000	70,000	12,000	10,000	14,557	10,210	22,952	25,760
On hand at end of year, total.....	3,403,256	4,324,890	1,647,830	1,643,438	1,776,885	1,375,031	1,040,040	1,483,585	1,236,058	1,349,139	1,934,548
In consuming establishments, total.....	1,732,636	1,000,090	751,219	778,158	570,646	542,191	533,232	907,097	594,184	1,010,738	680,471
In cotton-growing states.....	718,117	973,731	213,418	234,509	241,611	101,114	121,349	186,458	112,471	311,307	184,000
In all other states.....	1,014,519	926,359	537,801	543,649	629,035	441,077	411,883	720,639	481,713	705,431	496,411
In public storage and at compresses.....	1,220,570	1,874,890	576,617	495,280	558,239	432,840	308,808	325,099	444,020	668,668	1,157,747
Elsewhere (estimated).....	450,000	850,000	320,000	375,000	350,000	400,000	200,000	251,389	197,248	108,910	668,668

## METHOD OF COLLECTING AND ASSEMBLING DATA.

The data relative to cotton ginned have been collected by local agents of the Census Bureau who canvassed the ginner and delinters. Information as to cotton and linters consumed, stocks held in consuming establishments, and stocks in public storage and at compresses has been secured by these same local agents in the cotton-growing states; in all other states it has been obtained by correspondence. Stocks at ports, generally known as "port stocks," are included in the census reports as stocks held in consuming establishments, in public storage and at compresses, and elsewhere, respectively. The statistics of imports and exports have been compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

The supply of cotton for the year comprises the stocks held at the beginning of the year, together with the net imports of cotton and the amount of cotton ginned.

The statistics showing the distribution of the supply give the quantity of cotton used in manufacture during the year, the amount destroyed by fire, that exported, and stocks in the country at the close of the year. The total for stocks held is made up of the quantity in consuming establishments both in the cotton-growing states and in all other states, that held

in public storage and at compresses, and the estimated amount held elsewhere.

To secure complete data regarding the stocks it would be necessary to canvass all agencies which handle cotton and linters. There are approximately 2,000,000 growers, 25,000 ginner, 900 cottonseed-oil mills, 3,200 public storage places, and 2,100 cotton-consuming establishments. In addition, there are numerous transportation companies, local buyers, merchants, and others who handle more or less cotton during the season. It is manifestly impracticable to obtain monthly reports from so many agencies, and the Bureau of the Census has, therefore, adopted the plan of securing individual reports of the quantity of cotton and linters consumed during each month, and of stocks on hand in consuming establishments and in independent warehouses, compresses, and other public storage places at the end of the month.

In order to present a comprehensive statement of the distribution of the supply of cotton and linters, however, it is necessary to include the item of stocks held "elsewhere"—that is, the quantity of baled cotton in the actual possession of merchants, buyers, ginner, transportation companies, and producers, mentioned above as not having been canvassed. Full consideration has been given to all the factors entering into the situation in arriving at the quantity so held on July 31, 1916, and the amount has been estimated

at 400,000 bales of cotton and 50,000 bales of linters. These amounts, while conjectural, are believed to be approximately correct.

The supply of cotton for the season of 1915-16, as computed from the stocks at the beginning of the year and the imports and the ginnings during the year, falls short 102,722 bales of the total quantity consumed in manufacture, destroyed by fire, exported, and held as stocks at the end of the year, and this amount is accordingly entered in the table under the heading, "To balance distribution."

It is to be expected that the figures for the total supply, as thus computed, will not equal those for the total distribution, as a number of conditions affect these data. Among the factors responsible for this difference may be named the following: (1) The inclusion of rebaled samples, commonly called "city crop," in the statistics of distribution; (2) the lack of uniformity on the part of manufacturers and others in returning stocks; and (3) an understatement by ginners of the quantity of cotton produced, due largely to their inability to make accurate estimates at the time of the March canvass of the quantity of cotton remaining to be ginned. It is impossible to state, with any degree of accuracy, how much any one of these factors contributes to the difference. The amount due to each, no doubt, varies in different seasons, but a considerable part of the difference between the figures for supply and those for distribution in any season is certainly attributable to the first-named cause. Between the time a bale of cotton leaves the ginney and the time it reaches the consumer it is "sampled" a number of times—that is, small quantities of the fiber are extracted from the bale by successive bidders for use in determining its grade and value. Those samples, with other cotton from time to time separated from the original packages, are rebaled, and such bales are counted in the statistics of exports, consumption, and stocks. Statistics of supply based upon an enumeration of the bales at the gineries before any samples have been removed show, therefore, a smaller number of bales than the statistics of exports, consumption, and stocks on hand combined, although there is present in each case the same amount of cotton. The amount of this rebaled cotton varies in different seasons with the size of the crop and because of other conditions.

The supply of linters as computed also falls short of the distribution by 111,475 bales. This is accounted for almost entirely by the inclusion of bleached linters and possibly bleached hull fiber in the statistics of linters exported. This has resulted in some duplication, since the raw linters bleached have been reported as consumed by the manufacturers engaged in this work. While full data concerning the exports of bleached linters are not available from the information at hand, the total for the year is believed to be not

far from 100,000 bales. The Bureau of Foreign and Domestic Commerce has arranged to collect data of bleached linters exported, and duplication of this character for the season of 1916-17 will be eliminated.

PERIODICAL COTTON REPORTS.

During the season of 1916-17, as heretofore, practically semimonthly reports of cotton ginned will be issued. The dates to which the statistics of these reports will relate and the dates on which they are expected to be published are presented in the following schedule:

GINNING REPORTS TO BE ISSUED DURING THE SEASON OF 1916-17.

REPORT NO.	Date to which report relates (close of business).	Date of publication (10 a. m.).
1.....	Aug. 31	Sept. 8
2.....	Sept. 24	Oct. 2
3.....	Oct. 17	Oct. 25
4.....	Oct. 31	Nov. 8
5.....	Nov. 13	Nov. 21
6.....	Nov. 30	Dec. 8
7.....	Dec. 12	Dec. 20
8.....	Dec. 31	Jan. 9
9.....	Jan. 15	Jan. 23
10.....	Feb. 28	Mar. 20

The statistics in these reports show conditions at the close of business on the days to which the reports relate. For every report the canvassing agents are given approximately one week in which to visit the gineries and secure the returns. Summaries showing the number of bales ginned to a specified date are telegraphed to the bureau on the last day of the canvass. On the following morning the figures in these summaries are added and the results given to the public at 10 o'clock.

At the time of telegraphing the summaries the agents are required to mail the individual returns of the gineries which they have collected and used in preparing the summaries. This method affords a check on the statistics in the report, as the returns are examined and added in the bureau and necessary revisions made in the figures of the published preliminary reports.

There will be monthly reports of cotton and linters consumed, imported, exported, and on hand, and of active consuming cotton spindles. Each of these will relate to a calendar month and will be published about the 14th of the succeeding month.

Monthly reports concerning cotton seed and cottonseed products will be collected in compliance with the act of Congress approved August 7, 1916. These reports will show for the oil mills the quantities of cotton seed received, crushed, and on hand, and the quantities of cottonseed products manufactured, consumed, shipped out, and on hand, and for the refineries the quantities of crude and refined oil consumed and on hand.



The law mentioned above also requires quarterly reports of cotton fiber used in the manufacture of gun-cotton and explosives of all kinds, and of absorbent and medicated cotton. The data will be collected and the reports published as soon as possible after the close of each quarter.

#### DISTRIBUTION OF REPORTS.

Within a few hours after the information has been made public all preliminary reports are printed on preaddressed cards and mailed to all ginners, manu-

facturers, warehousemen, and cottonseed-oil manufacturers, and to all other persons who have requested them. This method of using preaddressed post cards permits a more rapid distribution than would otherwise be possible. Newspapers are furnished with county totals of cotton ginned, thus providing interesting and valuable information to those most directly concerned. In addition, postmasters are provided with large cards showing the quantity ginned to each report date and are instructed to post them in conspicuous places.

# COTTON PRODUCTION IN THE UNITED STATES.

Table 3 is a comparative summary of the production of cotton and linters in the United States from 1899 to 1915, inclusive, as ascertained from the reports of ginners and delinters.

These statistics are given in running bales and in equivalent 500-pound bales and show separately the number of upland square, upland round, sea-island, and linter bales.

TABLE 3.—COMPARATIVE SUMMARY—COTTON AND LINTER PRODUCTION: CROPS OF 1899 TO 1915.

GROWTH YEAR.	COTTON (EXCLUSIVE OF LINTERS).						LINTERS.	
	Running bales, counting round as half bales.	Equivalent 500-pound bales.	Total.	Running bales.		Sea-island.	Running bales.	Equivalent 500-pound bales.
				Upland.				
				Square.	Round.			
1915.....	11,068,173	11,191,820	11,124,031	10,920,471	111,716	91,844	944,640	931,141
1914.....	15,905,840	16,134,930	15,934,649	15,795,377	57,618	81,654	832,401	856,900
1913.....	13,982,811	14,156,486	14,032,792	13,855,267	99,962	77,563	631,153	638,881
1912.....	13,488,539	13,703,421	13,529,303	13,373,998	81,528	73,777	602,324	609,594
1911.....	15,553,073	15,692,701	15,603,850	15,383,003	101,554	119,293	556,276	557,575
1910.....	11,568,334	11,608,616	11,624,777	11,421,522	112,887	90,368	397,628	397,072
1909.....	10,072,731	10,004,949	10,148,076	9,902,595	150,690	94,791	313,478	310,433
1908.....	13,086,005	13,241,799	13,207,157	12,870,994	242,305	93,858	346,126	345,507
1907.....	11,057,822	11,107,179	11,157,096	10,871,652	198,549	86,895	268,060	268,282
1906.....	12,983,201	13,273,809	13,117,310	12,791,541	268,219	57,550	322,064	321,689
1905.....	10,495,105	10,575,017	10,635,023	10,242,648	279,836	112,539	230,497	229,539
1904.....	13,451,337	13,438,012	13,599,412	13,198,944	296,151	104,317	245,973	241,942
1903.....	9,819,969	9,851,129	10,205,073	9,359,472	770,208	75,393	195,752	194,486
1902.....	10,588,250	10,630,945	11,078,882	9,992,665	981,264	104,953	196,223	196,223
1901.....	9,582,520	9,509,745	9,954,945	9,132,215	744,851	77,879	166,026	166,026
1900.....	10,102,102	10,123,027	10,486,148	9,629,762	768,092	88,294	143,500	143,500
1899.....	9,393,242	9,345,391	9,645,974	9,043,231	505,464	97,279	114,544	114,544

The quantity of cotton reported for the crop of 1915, counting round as half bales and excluding linters, is 11,068,173 running bales. Expressed in bales of 500 pounds gross weight, the crop amounted to 11,191,820 bales. Compared with the crop of 1914 (16,134,930 bales), there was a reduction of 4,943,110 bales, or 30.6 per cent. The crop of 1915 was the smallest produced since 1907, with the exception of that grown in 1909, which amounted to only 10,004,949 bales.

Practically the entire production of cotton in the United States is upland, which includes a number of long-staple varieties. Less than 1 per cent of the total crop of 1915 was of the sea-island variety. Although the production of sea-island cotton during the period covered by the table shows variations from 57,550 running bales in 1906 to 119,293 in 1911, there has been no general tendency toward an increase or a decrease in the production of this variety.

The production of linters shows a marked increase during the period covered by the table—from 114,544 equivalent 500-pound bales in 1899 to 931,141 bales in 1915. The quantity in 1915 shows an increase of 74,241 bales over that in 1914, notwithstanding the large reduction in the cotton crop. The gain in the output of linters in recent years has been due, in part, to the closer delinting of the seed for the better separation of the meat from the hulls. The marked increase during the past season, however, may be attributed to

the high price of linters, which are in great demand in the manufacture of explosives. Some mills now obtain in excess of 150 pounds of linters per ton of seed treated, whereas formerly few obtained as much as 50 pounds. The proportion of the crop of 1915 delinted was larger than for any prior crop, some of the seed used for planting even being passed through the machines. Detailed information regarding cotton seed crushed and linters obtained is presented on pages 59 to 68, where are also given the results of the census of manufactures for the cottonseed-products industry covering the season of 1913-14.

## PRODUCTION, BY STATES.

Table 4 shows, by states, the quantity of cotton produced from the crops of 1911 to 1915, inclusive, the percentage of the total crop represented by the crop of each state, the rank of each state according to quantity produced, and the production of linters. The production of cotton for earlier years is shown in Tables 15 and 36.

Eliminating California, the cotton crop of 1915 is the smallest in each of the states for any year covered by Table 4, with the exceptions of Arkansas, Georgia, and Tennessee in 1912. The production in Oklahoma showed the greatest proportionate reduction when compared with 1914, being only a trifle more than one-half as large as for the earlier year.



The Imperial Valley, in the southern part of California, is well adapted to the cultivation of cotton. This section has a very rich soil, a warm climate, a long season, and, situated as it is on a lower level than the Colorado River, the further advantage of being easily irrigated: The yield is high and the staple has length, strength, and uniformity, characteristics which are very desirable, and due, in part, to the absence of periods of drought or of excessive rains. The high cost of labor for picking cotton, however, is a drawback, while the suitability of the land for other crops undoubtedly restricts, to some extent, this culture. Cotton has been grown in this locality on a commercial basis for only a few years. There were 5,986 equivalent 500-pound bales ginned in 1910, 9,790 in 1911, 8,215 in 1912, 22,838 in 1913, 49,835 in 1914, and 28,551 in 1915. According to the estimates of the Department of Agriculture, the area in cotton this year is 98,000 acres, more than twice the acreage in cultivation a year ago.

The statistics for California include cotton grown in Mexico (Lower California) and brought into this country to be ginned. The same conditions of soil and climate are found in the Mexican portion of the Imperial Valley as in the American, while the cost of cultivating and picking is less because of the availability of Chinese labor. According to official reports, the quantity of unginned cotton imported into the customs district of southern California during the year ending July 31, 1915, produced about 21,000 bales of lint. All of this cotton came from Mexico.

The production of cotton in Arizona for 1915 showed a large decrease from the crop of 1914, the production for this state for the last three years being 2,299 bales in 1913, 7,142 bales in 1914, and 1,981 bales in 1915. The production in 1916 will likely show a material increase, since the estimated acreage planted this year is much greater. The larger portion of the cotton grown in this state has the same characteristics as the cotton grown in Egypt, having been propagated from seed brought from that country. The cotton is grown on irrigated land and the average yield is high. The suitability of the land for growing other and possibly more remunerative crops, however, will tend to restrict cotton cultivation in this state.

#### "BOLLY" COTTON.

At the close of each cotton season more or less cotton is damaged by frost, and the bolls do not open fully. Formerly this cotton was considered worthless and no attempt was made to save it. The high price of cotton in recent years, however, has resulted in the devising of machinery for handling unopened bolls. These machines thrash out the seed cotton, after which it is passed to the gins, where it is treated in the same way as hand-picked seed cotton. The quantity of this cotton, usually called "bollies," is increasing, many establishments, particularly in the western part of the

cotton belt, having installed the necessary machinery for treating it.

Because of the difficulty and expense of getting cotton picked late in the season, many growers deem it preferable at the last picking to snap the opened and partially opened bolls with the unopened ones and send all through the same machinery. While the grade, and consequently the price, of a portion of this mixed cotton is lowered, the loss on this account is practically balanced by the margin of expense saved by the easier method of gathering. This cotton is sometimes, though not uniformly, classed as "bollies." Nearly all of this snapped cotton is produced in Texas and Oklahoma, where the winds dry out the cotton in the unopened frost-bitten bolls.

#### COTTON INSECT PESTS.

Cotton growers in the United States have suffered serious damage because of the ravages of the boll weevil. Notwithstanding the efforts on the part of the National and State Governments and of individuals, it has not been possible to eradicate this pest. However, by seed selection, plant improvement, and better methods of cultivation and fertilization, the development of the cotton plant has been so advanced before the activities of the weevil begin as to curtail very materially the damage that may be done by it.

Insect pests of various kinds cause great damage to the growers of cotton in India, Egypt, Brazil, and other foreign countries. Because of the discovery of live pink boll worms in recent importations of cotton seed intended for planting and of raw cotton intended for spinning, rigid quarantine measures have been established for the safeguarding of the culture in this country.

The following statement concerning the activities of the boll weevil during the past season and of the work of the Department of Agriculture in preventing the introduction of other destructive insects into American cotton fields has been prepared by the Bureau of Entomology of the Department of Agriculture:

*Cotton insect pests in 1915.*—The cotton crop of 1915 in general was not seriously injured by insect pests other than the boll weevil. The unusual spread of the weevil in August, due to cyclonic disturbances and high winds, resulted in severe damage in many sections in the latter part of the season. The season was not brought to a close in south Georgia until December and the movement of the weevil continued until the 27th of that month. The most important features of the year were the invasion of 13,400 square miles of territory in Georgia and 1,700 square miles in Tennessee, neither of which states has ever before been infested, the infestation of 11 sea-island cotton counties of Florida and Georgia, the regaining of all lost territory in central Texas and Oklahoma, and the complete infestation of Mississippi.

The territory invaded in 1915 included 86,840 square miles, the greatest gain ever made by the weevil in a single year. There were no compensating losses of territory. The total area now infested amounts to 409,140 square miles. The progress of the insect is shown on the map on page 32.

*Protection against foreign insect pests.*—The boll weevil is an illustration of the fact that many of the most injurious insect pests

now found in the United States are of foreign origin. There is another cotton pest known as the pink boll worm which does not occur in the United States but which causes serious losses in Egypt, India, and other countries. This insect lives in the seeds of the cotton plant and may be readily transported from one part of the world to another. There is every indication that it would be able to establish itself in the United States and would add enormously to the annual losses which cotton planters suffer as a result of insect attack.

On account of this danger, the Federal Horticultural Board of the Department of Agriculture promulgated a quarantine in 1913, in which the introduction of foreign cotton seed was prohibited. Some time after this quarantine went into operation it was found that considerable quantities of seed occur in bales of lint, in some cases as many as 1,000 seeds per bale. It therefore became necessary to devise some means of treating the bales of foreign cotton arriving at American ports in such a way as to destroy the insects. After many experiments it was found that the most feasible way of disinfecting the bales was to fumigate them in vacuum chambers with hydrocyanic-acid gas. The method was perfected late in 1915, and the quarantine which originally affected only foreign cotton seed was extended to include bales of lint from all foreign countries, with a proviso that these would be admitted after fumigation under the supervision of the board. This quarantine took effect on February 1, 1916, and resulted in the construction of fumigation establishments—two at Boston and others at New York, Newark, and San Francisco. Since the 1st of February 139,065 bales of cotton have been fumigated, the bulk of it at the port of Boston. The process is found to be economical and does not interfere with the rapid movement and distribution of the cotton. This fumigation has been supplemented by the screening and inspection of mills using foreign cotton and the requirement of the burning of any class of waste which includes seeds. This provision has especial reference to the stocks of foreign cotton which arrived in this country prior to the inauguration of fumigation.

It is believed that the system of fumigation which is now in operation gives the United States complete protection against foreign insect pests. The cost of the protection is inconsiderable in comparison with the losses which would probably result from the introduction of any of the several foreign pests, including the pink boll worm.

#### COTTON AND LINTERS REMAINING TO BE GINNED.

The special agents, who are regularly employed by this bureau to collect statistics of the production, consumption, and stocks of cotton and linters, were required at the March or final canvass of the ginner to obtain an estimate from each ginner of the number of bales of cotton remaining to be ginned, and from each cottonseed-oil mill of the number of bales of linters to be obtained by reginning cotton seed after the date of the canvass. These amounts, which are included in the total production for the crop year, are shown separately, by states, in Table 5 for the crops of 1913, 1914, and 1915.

The quantity of cotton from the crop of 1915 which the ginner stated would be ginned after the date of the March canvass was 39,623 bales. This is equal to only about one-third of the corresponding amount for the crop of 1914. The comparatively small crop and the price of the staple tended to a more rapid ginning, and, consequently, less cotton remained to be ginned after the March canvass. The quantity of linters remaining to be obtained by the oil mills, 121,606 bales, is the largest returned for any year since the Bureau of the

Census began to collect statistics of this character. The closer delinting of the seed, due to the great demand for this fiber in the manufacture of explosives, accounts for this larger amount. Because of the large quantity of seed estimated as remaining to be crushed after the March canvass, it was decided to ask the oil mills for a report after the close of the crushing season. Accordingly, another canvass of these establishments was made in June, and the total production of linters for the season, shown in Tables 3 and 4, is the result obtained from this later canvass.

TABLE 5.—COTTON TO BE GINNED AND LINTERS TO BE OBTAINED AFTER THE MARCH CANVASS, BY STATES: 1913 TO 1915.

STATE.	COTTON AND LINTERS TO BE GINNED AFTER THE MARCH CANVASS (RUNNING BALES, COUNTING ROUND AS HALF BALES).					
	Cotton, crop of—			Linters, crop of—		
	1915	1914	1913	1915	1914	1913
United States.....	39,623	121,528	20,267	121,606	95,360	56,803
Alabama.....	841	6,543	504	10,145	8,002	4,702
Arkansas.....	4,547	7,689	5,809	10,542	3,636	3,594
Florida.....	2	64	15	(1)	83	66
Georgia.....	1,077	13,707	1,684	30,581	18,859	13,943
Louisiana.....	115	2,414	668	5,816	1,772	2,057
Mississippi.....	4,429	17,806	4,002	11,658	6,780	8,172
North Carolina.....	3,101	20,008	7,758	6,317	7,550	5,779
Oklahoma.....	9,249	10,216	362	5,247	8,155	686
South Carolina.....	1,509	15,336	3,382	8,729	8,024	5,500
Tennessee.....	1,361	3,660	933	10,424	3,528	4,274
Texas.....	11,711	20,699	2,365	19,360	26,931	7,062
All other states.....	1,681	3,386	1,785	2,787	2,040	1,068

<sup>1</sup> Included in "All other states."

#### COTTON GINNED TO SPECIFIED DATES.

The collection of statistics of cotton ginned to specified dates was designed to place in the possession of all concerned reliable data as to the rapidity with which the cotton crop is being harvested and ginned. Statistics compiled by this method have, after a series of years, an incidental but very considerable value by reason of the deductions made possible by a careful comparison of current reports with those of previous years. The collection of data of this character was inaugurated in 1902. Three reports were made for that crop, 6 each for the crops of 1903 and 1904, and 10 for each crop since. Table 6 shows the quantity of cotton ginned to specified dates from the crops of 1902 to 1915, inclusive, and the percentage of the crop ginned to each report date. As it is not practicable before the close of the season, to express in equivalent 500-pound bales statistics of the quantity of cotton ginned, the amounts in Table 6 are in running bales, counting round as half bales and excluding linters, and the total amounts for the season, as thus obtained, are used as the bases for the percentages shown in the table.

The quantity of cotton ginned from the crop of 1915 prior to September 1 was 463,883 bales, a much smaller amount than for any preceding year since 1910. More than one-half of the total crop was ginned prior to October 18, while by November 14 almost four-fifths of the crop had been ginned.

COTTON PRODUCTION IN THE UNITED STATES.

TABLE 6.—COTTON GINNED TO SPECIFIED DATES AND THROUGHOUT THE SEASON, AND PER CENT OF TOTAL GINNED TO EACH DATE: 1902 TO 1915.

[Quantities are given in running bales, except that round bales are counted as half bales. Linters are not included.]

GROWTH YEAR.	COTTON GINNED TO—									Total ginned.
	Sept. 1.	Sept. 25.	Oct. 18.	Nov. 1.	Nov. 14.	Dec. 1.	Dec. 13.	Jan. 1.	Jan. 16.	
	QUANTITY (BALES).									
1915.....	463,883	2,903,829	5,708,730	7,378,886	8,771,275	9,703,612	10,306,309	10,636,778	10,761,990	11,068,173
1914.....	490,317	3,393,752	7,619,747	9,526,912	11,068,240	13,073,336	13,972,229	14,443,146	14,915,850	15,905,840
1913.....	799,099	3,246,655	6,973,518	8,330,396	10,444,529	12,083,412	12,927,428	13,347,721	13,582,036	13,982,811
1912.....	730,884	3,007,271	6,374,206	8,569,222	10,299,646	11,854,541	12,439,036	12,907,405	13,083,930	13,488,539
1911.....	771,297	3,576,594	7,758,621	9,970,905	11,313,236	12,816,807	13,770,727	14,317,002	14,515,799	15,553,073
1910.....	353,011	2,312,074	5,423,628	7,345,953	8,750,433	10,139,712	10,695,443	11,084,615	11,253,147	11,503,334
1909.....	388,242	2,568,150	5,530,967	7,017,549	8,112,199	8,876,886	9,353,085	9,647,327	9,787,592	10,072,731
1908.....	402,229	2,599,639	6,296,166	8,191,557	9,595,809	11,008,601	11,904,269	12,466,293	12,666,203	13,086,065
1907.....	200,278	1,532,602	4,420,258	6,123,562	7,300,665	8,343,396	9,284,070	9,951,605	10,339,551	11,057,822
1906.....	407,551	2,057,283	4,931,621	6,906,395	8,562,242	10,027,863	11,112,789	11,741,039	12,176,199	12,933,201
1905.....	476,655	2,355,716	4,990,566	6,457,595	7,801,130	8,689,663	9,297,819	9,725,426	9,989,634	10,496,105
1904.....	374,821	.....	6,417,894	.....	9,786,646	.....	11,971,477	.....	12,707,900	13,451,337
1903.....	17,302	.....	3,706,243	.....	6,815,162	.....	8,526,244	.....	9,485,537	9,819,969
1902.....	.....	.....	5,683,006	.....	.....	.....	8,905,505	.....	.....	10,588,250
PER CENT OF TOTAL.										
1915.....	4.2	26.2	51.6	66.7	79.2	87.7	93.1	96.1	97.1	100.0
1914.....	3.0	21.3	47.9	61.8	73.4	82.2	87.8	90.8	93.8	100.0
1913.....	5.7	23.2	49.9	63.2	74.7	86.5	92.5	95.5	97.1	100.0
1912.....	5.4	22.3	45.8	65.8	76.4	87.9	92.2	95.7	97.0	100.0
1911.....	5.0	23.6	49.9	64.1	72.7	82.4	88.5	92.1	93.3	100.0
1910.....	3.1	20.0	46.9	63.5	75.9	87.7	92.5	95.8	97.3	100.0
1909.....	3.9	25.5	54.9	69.7	80.5	88.1	92.9	95.8	97.2	100.0
1908.....	3.1	19.8	48.1	62.6	73.3	84.1	91.0	95.3	96.8	100.0
1907.....	1.8	13.9	40.0	55.4	66.0	75.5	84.0	90.0	93.5	100.0
1906.....	3.1	15.8	38.0	53.2	65.9	77.2	85.6	90.4	93.8	100.0
1905.....	4.5	22.4	47.6	61.5	71.5	82.8	88.6	92.7	95.2	100.0
1904.....	2.8	.....	47.7	.....	72.8	.....	89.0	.....	94.9	100.0
1903.....	0.2	.....	37.7	.....	69.4	.....	86.8	.....	96.6	100.0
1902.....	.....	.....	53.7	.....	.....	.....	84.1	.....	.....	100.0

Data as to sea-island cotton ginned to specified dates are presented in Table 13 (p. 26), and similar data as to cotton put up in round bales are given in the following statement for the crops of 1909 to 1915:

NUMBER OF ROUND BALES INCLUDED IN REPORTS OF COTTON GINNED TO SPECIFIED DATES: 1909 TO 1915.

SPECIFIED DATE.	ROUND BALES GINNED TO SPECIFIED DATES: CROP OF—						
	1915	1914	1913	1912	1911	1910	1909
Sept. 1.....	8,947	356	7,610	7,434	7,709	10,976	11,587
Sept. 25.....	32,412	3,394	26,933	19,574	27,913	38,026	48,070
Oct. 18.....	54,783	15,235	49,030	41,745	53,858	60,183	88,716
Nov. 1.....	68,577	23,182	61,577	54,539	68,313	81,183	109,021
Nov. 14.....	82,312	31,904	74,167	62,768	75,963	93,364	123,757
Dec. 1.....	93,361	39,682	86,878	73,030	87,996	101,713	134,393
Dec. 13.....	100,925	42,796	91,686	75,772	92,790	106,456	140,024
Jan. 1.....	105,785	44,904	94,265	77,999	96,227	109,292	143,949
Jan. 16.....	106,968	50,942	96,807	78,690	97,654	111,079	146,378
Total.....	111,716	57,618	99,962	81,523	101,554	112,887	150,690

Ginnings to specified dates, by states and by counties.—The quantity of cotton ginned to given dates from the crops of 1909 to 1915, and the percentage of the crop

ginned to each of the report dates, are shown by states in Tables 7 and 8. Considerable differences exist among the several states in the proportion of the total amount ginned to the specified dates. For instance, in 1915 almost two-thirds of the total crop of Texas had been ginned by October 18, while Tennessee showed only a little more than one-fourth.

The quantity of cotton from the crop of 1915 ginned to each of the report dates is given by counties in Table 58 (pp. 81 to 90). This table permits a close study of the rapidity with which cotton is ginned in various localities and enables the making of analyses which are both interesting and valuable. An examination of the table shows that in a number of counties in southern Texas a large part of the crop is harvested and ginned prior to September 1, and that by September 25 about 75 per cent of the crop is ginned, a few of the counties in the extreme southern part practically completing the cotton harvest by November 1.



# COTTON PRODUCTION IN THE UNITED STATES.

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TABLE 8.—PER CENT OF THE TOTAL COTTON GINNED TO SPECIFIED DATES, BY STATES: 1909 TO 1915.

[Based on figures given in Table 7, page 18.]

STATE.	Growth year.	PER CENT OF TOTAL COTTON GINNED TO—									
		Sept. 1.	Sept. 25.	Oct. 18.	Nov. 1.	Nov. 14.	Dec. 1.	Dec. 13.	Jan. 1.	Jan. 16.	
United States.....	1915	4.2	26.2	51.6	66.7	79.2	87.7	93.1	96.1	97.1	
	1914	3.0	21.3	47.9	61.8	73.4	82.2	87.8	90.8	93.8	
	1913	5.7	23.2	49.9	63.2	74.7	86.5	92.5	95.5	97.1	
	1912	5.4	22.3	51.0	65.8	76.4	87.9	92.2	95.7	97.0	
	1911	5.0	23.6	49.9	64.1	72.7	82.4	88.5	92.1	93.3	
	1910	3.1	20.0	46.9	63.5	75.9	87.7	92.5	95.8	97.3	
	1909	3.9	25.5	54.9	69.7	80.5	88.1	92.9	95.8	97.2	
Alabama.....	1915	3.8	30.3	54.2	70.9	83.3	91.6	96.3	98.2	98.7	
	1914	2.7	22.6	46.8	61.7	73.4	83.1	90.8	94.6	96.8	
	1913	3.0	22.0	56.6	68.5	79.6	92.0	97.3	98.9	99.4	
	1912	1.0	14.5	44.6	61.0	72.4	87.4	93.0	97.1	98.5	
	1911	2.4	21.2	49.5	64.2	73.1	84.7	92.1	95.5	96.7	
	1910	0.4	16.9	44.1	62.8	75.1	89.2	94.7	97.5	98.5	
	1909	1.3	18.1	49.3	65.0	77.5	88.2	94.9	97.8	98.7	
Arkansas.....	1915	(1)	7.7	35.9	56.4	72.6	83.0	91.5	95.4	96.6	
	1914	0.1	9.9	39.8	57.4	73.9	84.1	89.5	91.4	94.2	
	1913	0.1	6.8	31.0	41.6	58.4	76.1	85.3	89.9	93.2	
	1912	(1)	5.4	39.0	57.1	71.0	85.5	91.2	95.0	96.2	
	1911	(1)	4.8	30.6	48.9	62.0	74.9	82.2	86.0	87.8	
	1910	(1)	2.8	20.2	40.7	60.0	78.3	84.7	90.7	95.6	
	1909	0.1	12.0	47.4	67.7	80.0	88.0	92.1	94.2	96.3	
Florida.....	1915	8.5	34.4	58.1	73.0	84.1	90.8	96.5	98.3	99.4	
	1914	5.8	28.2	47.8	62.5	72.7	80.5	89.3	94.5	97.2	
	1913	4.4	24.5	53.9	70.9	79.8	87.7	94.6	97.9	98.6	
	1912	3.1	16.6	40.1	60.1	71.8	82.7	89.9	93.3	97.4	
	1911	4.0	22.8	45.5	59.4	69.1	78.4	86.7	91.5	93.3	
	1910	0.9	16.8	40.5	57.9	69.7	81.0	89.4	93.9	96.4	
	1909	5.7	31.6	56.6	73.8	83.4	90.7	94.6	97.2	98.2	
Georgia.....	1915	6.9	36.9	60.8	73.7	84.5	91.3	96.1	98.4	99.0	
	1914	5.0	28.2	50.2	64.8	75.8	83.9	90.0	93.6	95.3	
	1913	3.1	20.9	55.3	68.5	77.7	88.1	94.4	97.8	98.6	
	1912	1.9	15.0	43.8	61.4	73.5	86.3	92.4	96.9	98.3	
	1911	4.8	27.4	55.6	68.3	75.4	83.7	90.1	93.9	95.1	
	1910	1.1	20.2	50.4	68.5	79.3	89.7	94.2	97.2	98.2	
	1909	5.7	29.0	60.2	74.9	84.3	90.4	95.5	98.0	98.8	
Louisiana.....	1915	1.7	34.0	66.2	80.6	89.0	94.9	97.7	98.7	99.1	
	1914	0.8	20.8	49.8	65.7	75.5	84.5	91.8	94.5	96.1	
	1913	1.7	17.8	37.5	50.9	63.2	78.4	89.6	94.0	96.2	
	1912	0.5	19.7	54.2	69.8	80.2	91.6	96.4	97.8	98.5	
	1911	2.1	23.4	46.5	61.0	70.8	82.4	89.4	92.6	93.9	
	1910	0.4	18.6	40.1	62.7	74.5	83.3	94.6	97.3	98.3	
	1909	1.3	24.2	55.7	72.8	84.1	92.3	96.2	97.6	98.2	
Mississippi.....	1915	0.5	19.4	45.6	63.2	76.5	86.6	93.2	96.0	96.9	
	1914	0.2	13.4	39.0	54.9	68.8	81.0	88.9	91.6	93.9	
	1913	0.2	9.6	34.3	45.4	58.7	76.4	86.6	91.3	94.0	
	1912	(1)	5.6	34.5	50.9	64.2	81.4	88.0	93.2	94.8	
	1911	0.2	8.3	33.0	50.0	61.6	79.3	85.2	89.6	90.8	
	1910	(1)	6.9	29.6	47.6	62.6	80.1	88.0	93.4	95.5	
	1909	0.2	9.0	36.4	53.3	68.2	81.0	89.1	93.7	95.8	
North Carolina.....	1915	(1)	11.2	35.9	55.4	71.1	83.1	90.4	94.4	96.2	
	1914	0.1	8.7	31.0	44.1	57.3	69.5	79.0	83.9	88.1	
	1913	(1)	6.0	30.1	45.9	58.9	74.3	84.6	90.7	93.5	
	1912	0.1	11.2	39.3	54.8	69.2	83.3	90.4	94.6	96.6	
	1911	0.1	13.9	38.9	53.1	63.6	73.6	81.1	86.6	88.5	
	1910	(1)	6.1	33.2	51.3	65.7	81.7	88.3	93.2	95.4	
	1909	0.2	12.7	40.2	58.5	73.7	84.5	91.8	95.6	97.1	
Oklahoma.....	1915	(1)	0.3	10.6	27.6	53.0	71.6	82.5	90.3	92.1	
	1914	(1)	8.4	36.6	53.5	70.6	82.7	86.7	88.8	93.1	
	1913	0.6	17.7	46.4	63.7	79.1	90.7	93.7	95.5	97.9	
	1912	(1)	7.7	39.6	59.6	72.1	86.5	89.8	94.3	96.1	
	1911	0.4	11.4	39.0	54.6	64.7	77.1	84.9	88.6	90.1	
	1910	(1)	12.0	45.8	63.6	79.1	90.2	94.4	97.4	98.4	
	1909	0.2	24.3	59.6	74.7	86.2	91.5	93.1	95.1	96.4	
South Carolina.....	1915	0.4	22.1	49.5	65.7	78.5	87.0	93.5	96.5	97.0	
	1914	0.9	19.5	44.4	58.4	69.9	78.8	85.1	89.0	91.3	
	1913	0.5	13.6	43.7	59.7	70.2	81.8	90.0	94.6	96.5	
	1912	0.3	14.2	44.1	59.7	72.2	85.1	92.2	95.8	97.4	
	1911	1.1	20.0	46.5	60.4	68.8	77.5	84.1	89.2	90.8	
	1910	(1)	13.3	42.6	60.2	73.4	85.6	91.5	95.3	97.1	
	1909	1.7	25.1	54.9	69.6	80.3	87.8	93.6	96.7	98.0	
Tennessee.....	1915	(1)	3.1	26.8	49.6	69.1	80.6	89.5	95.2	96.7	
	1914	(1)	4.3	27.5	46.4	64.1	78.3	85.8	89.8	92.2	
	1913	(1)	5.0	36.0	47.5	63.7	83.0	92.9	96.6	97.7	
	1912	(1)	0.4	24.9	44.3	59.1	78.0	86.1	92.9	94.6	
	1911	(1)	3.6	29.3	49.1	61.6	74.4	83.8	88.7	89.8	
	1910	(1)	0.5	18.0	40.4	59.9	77.8	84.0	90.1	93.0	
	1909	(1)	7.1	42.1	61.8	76.2	85.7	92.0	94.2	95.1	
Texas.....	1915	8.8	37.4	65.2	76.4	85.2	90.6	93.5	95.7	96.6	
	1914	6.1	30.4	61.9	72.2	80.0	85.3	88.3	90.2	94.0	
	1913	17.4	45.8	65.0	78.2	87.8	94.7	96.1	97.1	98.5	
	1912	14.5	43.1	69.5	79.9	86.6	92.9	94.0	96.0	97.1	
	1911	13.6	40.6	65.7	78.2	84.6	91.3	94.0	95.6	96.5	
	1910	11.0	42.8	70.2	81.5	89.4	94.7	96.6	97.9	98.9	
	1909	9.6	43.0	67.8	77.8	85.2	89.6	91.6	94.3	96.3	
All other states <sup>2</sup> .....	1915	0.1	3.4	21.0	40.3	58.0	70.1	79.2	85.9	90.6	
	1914	0.7	5.0	22.3	35.6	49.7	63.2	70.7	76.1	84.7	
	1913	(1)	5.2	27.0	39.1	54.9	72.0	83.2	89.4	92.4	
	1912	(1)	3.0	26.3	48.1	63.0	78.1	86.4	91.3	93.1	
	1911	(1)	3.9	24.0	42.0	53.3	64.2	74.3	79.4	82.2	
	1910	(1)	0.1	10.1	29.3	45.8	66.6	76.1	83.7	88.2	
	1909	(1)	3.8	34.6	59.9	76.0	85.6	92.2	94.9	96.5	

<sup>1</sup> Less than one-tenth of 1 per cent.

<sup>2</sup> Includes Arizona, California, Kansas, Kentucky, Missouri, New Mexico, and Virginia.



## COTTON PRODUCTION AND DISTRIBUTION.

An analysis of the periodical statistics of cotton ginned, as shown in Table 7, is presented in Table 9, which gives the number of bales of cotton ginned dur-

ing each of the report periods, together with the corresponding percentages for the crops of 1911 to 1915, inclusive.

TABLE 9.—QUANTITY OF COTTON AND PERCENTAGE OF THE TOTAL GINNED DURING EACH PERIOD BETWEEN REPORT DATES: CROPS OF 1911 TO 1915.

[Quantities are given in running bales, except that round bales are counted as half bales. Linters are not included.]

PERIOD.	1915		1914		1913		1912		1911	
	Quantity (bales).	Per cent of total.	Quantity (bales).	Per cent of total.	Quantity (bales).	Per cent of total.	Quantity (bales).	Per cent of total.	Quantity (bales).	Per cent of total.
Total.....	11,068,173	100.0	15,905,840	100.0	13,982,811	100.0	13,488,539	100.0	15,553,073	100.0
Prior to Sept. 1.....	463,883	4.2	480,317	3.0	799,099	5.7	730,884	5.4	771,297	5.0
Sept. 1 to Sept. 25.....	2,439,946	22.0	2,913,435	18.3	2,447,556	17.5	2,276,387	16.9	2,005,297	18.7
Sept. 25 to Oct. 18.....	2,804,901	25.4	4,225,995	26.6	3,726,863	26.6	3,866,935	28.7	4,082,027	26.2
Oct. 18 to Nov. 1.....	1,670,156	15.1	2,207,165	13.9	1,856,878	13.3	1,995,016	14.8	2,212,284	14.2
Nov. 1 to Nov. 14.....	1,392,389	12.6	1,841,828	11.6	1,614,133	11.5	1,430,424	10.6	1,342,331	8.6
Nov. 14 to Dec. 1.....	932,337	8.4	1,405,146	8.8	1,643,883	11.8	1,554,895	11.5	1,503,571	9.7
Dec. 1 to Dec. 13.....	602,697	5.4	898,843	5.6	839,016	6.0	584,495	4.3	953,920	6.1
Dec. 13 to Jan. 1.....	330,469	3.0	470,917	3.0	420,293	3.0	468,369	3.5	540,275	3.5
Jan. 1 to Jan. 16.....	115,212	1.0	472,704	3.0	234,315	1.7	181,525	1.3	198,797	1.3
After Jan. 15.....	316,183	2.9	989,990	6.2	400,775	2.9	399,609	3.0	1,037,274	6.7

The period from September 25 to October 18 shows the largest ginnings for each of the years given in the table. This is to be expected, however, inasmuch as this period covers 23 days during a time of great activity in the harvesting of cotton, while most of the other periods are shorter. In 1915, 25.4 per cent of the total crop was ginned during this period, as compared with 26.6 per cent in 1913 and in 1914, 28.7 per cent in 1912, and 26.2 per cent in 1911. The variations in the proportion of the total ginned during the period from November 1 to November 14 are rather pronounced, the percentages ranging from 8.6 in 1911 to 12.6 in 1915. The quantity ginned during any period is obviously affected by the weather conditions and by the size of the crop.

## AVERAGE WEIGHT OF BALE.

Some ginners do not weigh the baled cotton turned out from their establishments, and some of those who do so fail to keep permanent records. In view of this condition and of the necessity of securing local weights in order to reduce the statistics to a uniform bale weight, so as to credit each county with its proper proportion of the crop, the bureau requires its canvassing agents to secure bale weights from local weighers, merchants, and other handlers of cotton. The statistics in Table 10 have been compiled from these data, and should constitute a very reliable record. This table shows, by states, for the crops of 1911 to 1915, the average gross weight of upland-square, upland-round, sea-island, and linter bales, and the number of square bales for which weights were returned to the bureau, with their total weight in pounds.

The number of square bales for which weights were returned to the bureau in 1915 was 6,364,290, more than one-half of the total number ginned during the season. The bale weights were returned in two installments, with the reports of cotton ginned to November 1 and to January 1. Since weights are secured for bales ginned in different periods, the figures

are representative of the varying conditions of the season and contribute to the reliability of the averages. Because of the variation throughout the season in the weights of the bales pressed, it is not possible to arrive at a reliable average for the crop before the season's ginning is practically completed. Weights of sea-island and of upland round bales were secured by the agents from the handlers of such cotton, and from these data were computed the average weights for round and sea-island bales. The average weights of the linter bales were computed from returns secured from the cottonseed-oil mills.

*Method of computing average bale weights.*—To obtain the average bale weights for a state, the average weights in pounds of the square, the round, and the sea-island bales weighed in each county were first multiplied separately by the numbers of bales of the respective kinds reported as ginned in the county. The several products thus obtained constituted the totals for the county. The county totals for the different kinds of bales were added separately to obtain the corresponding state totals, which were then divided respectively by the number of bales of the several kinds ginned in the state to obtain the average weight of each kind of bale. By deducting from the sum of the different kinds of bales one-half of the number of round bales, the divisor for finding the average weight of the bale, counting round as half bales, was obtained. The average bale weight for the crop of 1915, excluding linters, as thus computed is 505.6 pounds gross weight, as compared with 507.2 pounds for 1914, 506.2 pounds for 1913, 508 pounds for 1912, and 504.5 pounds for 1911.

The variation in the average weight of bale for upland cotton put up in square packages is pronounced throughout the cotton belt, the averages ranging from less than 440 pounds for a number of counties in North Carolina to more than 540 pounds for certain counties in Arkansas and Texas. For the states shown sepa-

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rately in the table the range is from 474.3 pounds in North Carolina to 525.8 in Texas. These variations are due to a number of causes, the principal one, no doubt, being the practice of putting in one package

the lint obtained from a single load of seed cotton, the quantity in a load depending upon capacity of wagons, character of roads, local customs, price of cotton, etc.

TABLE 10.—AVERAGE GROSS WEIGHT OF THE SEVERAL KINDS OF BALES AND NUMBER AND GROSS WEIGHT OF SQUARE BALES FOR WHICH WEIGHTS WERE RETURNED, BY STATES: 1911 TO 1915.

STATE.	Growth year.	AVERAGE GROSS WEIGHT OF BALE (POUNDS).					SQUARE BALES FOR WHICH WEIGHTS WERE RETURNED.	
		Cotton.				Linters.	Number.	Gross weight (pounds).
		Counting round as half bales.	Upland.		Sea-island.			
			Square.	Round.				
United States.....	1915	505.6	506.6	251.5	387.5	492.9	6,364,290	3,214,501,617
	1914	507.2	507.8	253.0	395.5	514.7	7,688,814	3,897,539,799
	1913	506.2	506.9	251.4	384.7	506.1	7,772,225	3,931,370,190
	1912	508.0	508.7	253.9	381.9	506.0	7,820,923	3,712,983,736
	1911	504.5	505.3	250.4	399.7	500.6	7,839,832	3,951,510,387
Alabama.....	1915	497.6	497.6	.....	.....	485.2	636,756	316,222,717
	1914	505.7	505.7	.....	.....	509.0	826,931	410,410,234
	1913	504.0	503.9	257.0	.....	500.9	873,197	439,509,807
	1912	505.3	505.3	241.9	.....	501.1	794,048	401,236,388
	1911	506.3	506.3	247.2	.....	499.0	871,926	442,181,697
Arkansas.....	1915	516.7	516.7	261.8	.....	497.9	477,886	246,018,068
	1914	508.5	508.5	348.3	.....	520.8	551,382	280,392,298
	1913	516.6	516.6	258.1	.....	516.9	592,931	305,967,413
	1912	513.7	513.7	261.6	.....	515.0	478,868	245,221,337
	1911	517.2	517.2	254.0	.....	518.0	470,847	242,543,037
Florida.....	1915	432.0	493.2	.....	372.7	(1)	18,068	8,023,375
	1914	448.2	488.7	.....	379.6	530.8	47,072	23,051,626
	1913	440.0	488.7	.....	361.3	459.5	31,387	15,401,229
	1912	448.4	490.1	.....	370.4	453.2	32,364	16,005,829
	1911	441.3	492.5	.....	375.4	432.9	34,661	17,148,143
Georgia.....	1915	492.5	495.4	.....	398.7	487.9	1,218,628	604,812,804
	1914	499.1	500.4	.....	494.4	412.6	1,382,898	691,431,261
	1913	493.7	495.4	.....	404.1	491.7	1,353,200	670,356,223
	1912	490.0	492.4	.....	491.6	491.6	1,053,577	519,326,762
	1911	495.4	497.5	.....	417.0	479.8	1,340,461	667,167,970
Louisiana.....	1915	506.3	506.3	250.0	.....	498.0	232,183	117,966,229
	1914	496.9	496.9	249.3	.....	523.5	279,015	139,314,883
	1913	508.0	508.1	242.0	.....	512.5	290,828	147,703,664
	1912	501.7	501.8	240.5	.....	513.1	277,460	139,974,808
	1911	505.0	505.0	243.2	.....	507.8	281,353	143,373,415
Mississippi.....	1915	515.4	515.4	.....	.....	505.1	494,237	253,502,927
	1914	511.4	511.4	.....	.....	531.4	556,749	284,593,130
	1913	523.5	523.5	.....	.....	532.0	567,093	295,067,200
	1912	520.9	520.9	.....	.....	529.3	499,896	259,014,266
	1911	514.7	514.7	.....	.....	521.6	533,081	273,552,560
North Carolina.....	1915	474.3	474.3	.....	.....	479.0	471,627	224,072,219
	1914	479.5	479.5	.....	.....	492.2	428,948	205,537,721
	1913	472.9	472.9	.....	.....	476.0	423,356	200,703,779
	1912	477.5	477.5	.....	.....	468.7	430,424	205,583,615
	1911	477.6	477.6	.....	.....	480.3	486,697	233,204,482
Oklahoma.....	1915	514.0	514.4	251.0	.....	498.6	322,143	165,295,583
	1914	512.0	512.1	250.7	.....	542.5	714,847	365,779,835
	1913	498.7	498.7	250.7	.....	530.2	632,065	314,913,462
	1912	508.0	508.1	251.5	.....	527.3	561,359	284,635,940
	1911	502.7	502.9	248.2	.....	519.9	569,066	284,572,432
South Carolina.....	1915	482.8	483.5	.....	350.3	477.9	646,646	312,980,322
	1914	491.6	492.1	.....	361.3	490.0	659,039	322,939,700
	1913	485.6	486.4	.....	356.7	483.2	768,771	373,281,653
	1912	482.8	483.6	.....	348.7	480.5	794,263	383,505,071
	1911	487.2	487.6	.....	350.6	477.9	1,245,555	605,512,193
Tennessee.....	1915	512.1	512.1	.....	.....	501.1	183,250	93,615,768
	1914	515.4	515.4	.....	.....	527.7	187,669	96,591,551
	1913	517.3	517.3	.....	.....	515.4	195,753	101,186,497
	1912	517.0	517.0	.....	.....	521.4	154,062	79,847,517
	1911	523.9	523.9	.....	.....	510.3	220,024	115,463,393
Texas.....	1915	525.8	526.1	251.3	.....	496.3	1,601,393	839,905,392
	1914	523.0	523.0	258.4	.....	520.2	1,970,879	1,028,823,250
	1913	522.8	522.9	250.2	.....	509.4	1,958,516	1,028,227,445
	1912	525.3	525.3	262.5	.....	506.8	2,180,044	1,142,736,945
	1911	518.2	518.2	253.2	.....	501.9	1,696,179	875,447,007
All other states.....	1915	504.9	504.9	.....	.....	503.6	61,433	31,245,608
	1914	516.5	516.5	.....	.....	523.1	82,485	42,704,280
	1913	512.1	512.1	.....	.....	519.1	85,128	43,988,618
	1912	507.9	507.9	.....	.....	520.3	70,558	36,834,658
	1911	517.8	517.8	.....	.....	531.1	92,374	48,314,053

<sup>1</sup> Included in "All other states."

Disparity between census and export bale weights.— The average weight of the bales exported during the year ending July 31, 1916, was 517.4 pounds, which is 11.8 pounds greater than the average for the crop of 1915, as computed from the returns of bale weights received by the bureau. This variation may be

ascribed to a number of reasons, the principal one, no doubt, being the fact that the states which contribute the larger portion of the export cotton are those which put up the heaviest bales. The average weight of the bale for the states of Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas, which furnish much the larger part of the export cotton, was 520.1 pounds, while that for the states of Alabama, Georgia, North Carolina, and South Carolina, which contribute most largely to the domestic consumption, was 488.5 pounds.

#### PRICES OF COTTON AND COTTON SEED.

The prices of cotton realized on the exchanges are obviously higher than those actually obtained by the growers in disposing of their crops, since they may include charges for freight, compression, and commissions. In order to make available reliable data as to the value of the cotton crop to the growers, the Bureau of Crop Estimates, of the Department of Agriculture, has collected data and prepared estimates showing, by states, the yearly average price of cotton and cotton seed paid to producers in the last five years. These estimates for lint cotton were prepared from the average prices on the first of each month, these monthly prices being weighted by the monthly marketings of cotton to obtain the yearly average. The estimated average prices per ton paid to producers for cotton seed were prepared from the average prices at the middle of each month, the monthly averages being weighted by the monthly marketings of seed to obtain the yearly averages. The average prices of cotton and cotton seed, by states, as computed for the crops of 1911 to 1915, inclusive, are as follows:

TABLE 11.—AVERAGE PRICE OBTAINED BY PRODUCERS FOR COTTON AND COTTON SEED, BY STATES: 1911 TO 1915.

[Compiled by the Bureau of Crop Estimates, Department of Agriculture.]

STATE.	YEARLY AVERAGE PRICE OBTAINED BY PRODUCERS FOR—									
	Lint cotton per pound, in cents, crop of—					Cotton seed per ton, crop of—				
	1915	1914	1913	1912	1911	1915	1914	1913	1912	1911
United States.....	11.22	7.33	12.48	11.48	9.56	\$33.60	\$17.90	\$22.40	\$19.20	\$17.10
Alabama.....	11.08	7.29	12.86	11.44	9.52	36.90	18.90	23.50	19.50	18.20
Arkansas.....	11.64	7.03	12.08	11.78	9.32	34.10	17.00	19.40	20.00	16.70
Florida.....	14.81	10.74	14.57	14.65	12.95	31.60	17.30	21.00	17.50	17.30
Georgia.....	11.30	7.44	12.90	11.60	9.55	36.90	20.20	24.20	20.50	16.90
Louisiana.....	10.94	7.03	12.24	11.38	9.60	32.00	18.60	18.50	19.70	18.00
Mississippi.....	11.51	7.29	12.59	11.87	9.82	34.30	18.70	22.40	21.80	17.50
Missouri.....	11.02	6.82	12.50	11.80	9.00	31.20	22.00	21.20	22.10	22.90
North Carolina.....	11.20	7.65	12.73	11.48	9.44	37.00	21.60	26.00	22.10	19.20
Oklahoma.....	11.13	6.81	11.78	11.12	8.90	30.60	14.60	20.50	17.50	16.00
South Carolina.....	11.21	7.76	12.86	11.70	9.48	36.50	20.80	25.70	21.20	17.20
Tennessee.....	11.40	7.09	12.82	11.94	9.28	35.00	18.30	24.50	22.90	18.10
Texas.....	11.02	7.22	12.19	11.29	9.75	29.30	15.30	20.60	17.10	16.20

The growers of cotton in the United States as a whole received for the lint produced from the crop of 1915 an average price of 11.22 cents per pound, as compared with 7.33 cents for the crop of 1914, 12.48 cents for the crop of 1913, 11.48 cents for the crop of 1912, and 9.56 cents for the crop of 1911. For each of the years shown the growers of Florida received a much

higher average than those of any other state. This is due to the large proportion of sea-island cotton, which constitutes almost 50 per cent of the total crop. The second highest average is shown by Arkansas for 1915, South Carolina for 1914, Georgia for 1913, Tennessee for 1912, and Mississippi for 1911. Oklahoma shows the lowest average price for each of the crops represented, except 1915. So many factors enter into the production, the handling, and the marketing of cotton that it is to be expected that the relative market values in different localities should vary from year to year. In some states, however, there are constant factors which operate toward a higher or a lower price. For instance, in South Carolina and Georgia a portion of each year's crop is made up of sea-island cotton and the long-staple varieties of upland. In these states, also, the cost of transportation to the seaboard or the centers of consumption is probably less than in most others, whereas in Oklahoma the haul to ports and mills is longer than in any other state.

According to the annual report of Mr. Henry G. Hester, secretary of the New Orleans Cotton Exchange, the average grade of the crop of 1915 was "middling to strict middling" and the average price of middling for the year was 11.99 cents per pound. According to the same report, the average price of middling cotton for the crop of 1914 was 7.94 cents per pound, and that of 1913 and 1912, 13.49 and 12.20 cents, respectively.

The yearly average price per ton of cotton seed paid to producers in the United States as a whole was \$33.60 for the crop of 1915, \$17.90 for 1914, \$22.40 for 1913, \$19.20 for 1912, and \$17.10 for 1911. The highest averages in the several states were shown by North Carolina for the crops of 1915 and 1913, by Missouri for the crops of 1914 and 1911, and by Tennessee for 1912. North Carolina, South Carolina, and Georgia uniformly show high average prices, both because the seed produced in these states yields high percentages of the more valuable products, and because there is considerable local demand for cottonseed meal for use in mixing fertilizers. On the other hand, the average prices in Texas, Oklahoma, and Arkansas are uniformly lower because of the lower yield of oil and cake from the seed produced in these states. The high price of linters during the past season accounts, in part, for the unusually high prices paid for cotton seed.

#### THE VALUE OF THE COTTON CROP.

The gross weight of upland and sea-island cotton and the estimated quantity of cotton seed, together with the estimated values of lint cotton and cotton seed for the crops of 1911 to 1915, are presented, by states, in Table 12. No account is taken of linters in computing the value of the crop, as the value of the cotton seed relates to seed before reginning. The estimated value of linters produced, however, is given in Table 55.



for the cotton crop of 1915 on this basis amounted to 241,500,000 pounds, leaving 5,354,410,000 pounds as the net weight of lint cotton produced.

In computing the values of the crops, the average prices of cotton and of cotton seed given in Table 11 have been used. On page 22 is stated the method of determining these prices, and the values given in the table must be considered accordingly. With the varying conditions found throughout the cotton belt, the compilation of absolutely accurate data as to the value of the crop is impossible. The statistics in Table 12 are, in a large sense, therefore, estimates, but it is believed they are sufficiently close to the facts to furnish a reliable reference. The average prices given in Table 11 have been multiplied in each case by the corresponding numbers representing the weights, while the average prices of seed for the several states have been applied to the estimated quantities of seed produced. The values of cotton and of seed are combined to make up the total value of the cotton crop, which appears in the first column of the table. The value of the crop of 1915, as thus determined, is \$795,840,000, as compared with \$720,080,000 for 1914, \$1,026,700,000 for 1913, \$904,130,000 for 1912, and \$869,690,000 for 1911. Thus the value of the crop of 1915 was higher than that of 1914, notwithstanding the fact that the quantity of lint cotton was very much less.

*Estimated seed production.*—It has generally been assumed that upland cotton, on an average, "thirds itself" at the gin—that is, the seed weighs twice as much as the lint. The greater care being exercised in selecting seed for planting, together with improved methods of ginning, tends to the saving of more lint from the first ginning than formerly, and the proportions are now estimated at 35 per cent lint for upland and 25 per cent lint for sea-island cotton. Computed on these bases, the quantity of seed produced in 1915 amounted to 4,992,000 tons.

Only approximate accuracy can be claimed for the figures of cottonseed production in Table 12, as different seasons and different localities present conditions which vary considerably. The character of soil, methods of cultivation, and conditions of weather during the growing and maturing periods materially affect the results.

#### COTTON GRADING AND MARKETING.

There has been a widespread demand for a change in the methods of marketing of cotton whereby greater regard shall be given the actual worth of the staple in the sale of cotton by the producer, whereas a large proportion of the cotton crop is disposed of by the growers with but scant attention to the real value of the fiber. The manufacturer, in arriving at the true value of the lint, carefully considers not only the appearance of the cotton as re-

gards color, dirt, and trash, but also the length, strength, and uniformity of the fiber. The producer, as a rule, has slight knowledge of these characteristics, and is somewhat at a disadvantage in disposing of his crop. The desirability of establishing a uniform basis for cotton grading has long been recognized by a majority of those interested in the cotton industry. While there are practical difficulties in the way of applying uniform standard grades throughout the handling of the cotton crop, it is believed these difficulties can be largely overcome. As a result of the demand for such action, Congress directed the Secretary of Agriculture to establish standards for the different grades of cotton, to prepare them in practical form, and to furnish them to anyone upon payment of the actual cost thereof. These grades were established, and, although their use was not compulsory, they were adopted by all the leading cotton exchanges and became widely distributed. The following statement, prepared by the Office of Markets and Rural Organization, reviews some of the activities of that office during the last year in connection with the cotton industry:

The annual appropriation bill for the Department of Agriculture, which was signed by the President on August 11, 1916, contains a reenactment, effective September 1, 1916, of the cotton futures act of August 18, 1914, with a few changes.

Section 11, by which orders sent abroad for the making of future contracts on foreign cotton exchanges are taxed, unless certain specified conditions are complied with, is omitted from the new act.

A new section, known as 6-A, has been inserted, which provides an optional contract, under which parties may, without being subject to tax, agree that under certain specified conditions the buyer may demand delivery of the basis grade named in the contract.

Another modification which will be of interest to the trade is the authority conferred upon the Secretary of Agriculture in case of disputes, even though only one question be referred to him for determination, to include in his findings a complete classification of the cotton involved, for the purpose of delivery on future contracts. Under the old law the findings of the Secretary of Agriculture were limited to the specific questions of grade, quality, or length of staple referred to him. In other words, if the dispute involved grade only, and the length of staple was found to be less than seven-eighths of an inch, the minimum length permitted for delivery on future contracts, the Secretary had no authority to include in a statement as to the length of staple in his findings.

Section 13 of the new act confers certain additional authority on the Secretary of the Treasury, in connection with the performance of the duties imposed upon him by the act.

A statement prepared by the Office of Markets and Rural Organization in regard to the administration of the cotton futures act up to July 1, 1915, was included in the bulletin on Cotton Production and Distribution for the season of 1914-15. Since that date investigations made by officials of the Department of Agriculture have resulted in the addition of two cities to the list of bona fide spot markets designated by the Secretary of Agriculture, so that there are now 15 such markets. Eleven of these markets are used in the establishment of commercial differences governing settlements for cotton delivered on future contracts, as prescribed in the act.

In addition to the standards for grades of white cotton established and promulgated December 15, 1914, standards for tinged and stained cotton were established by the Secretary of Agriculture on January 28, 1916, as follows: Yellow tinged cotton of the grades of low middling, strict low middling, middling, strict middling, and good middling; yellow stained cotton of the grades of middling, strict middling, and good middling; and blue stained cotton of the grades of middling, strict middling, and good middling. Ten sets of practical forms of these standards for color have been prepared and stored in vacuum for future reference, to be opened whenever it is found necessary or desirable to check the accuracy and uniformity of sets in use. Other practical forms of these standards for color have been distributed to the future exchanges and to organizations in the designated spot markets and, so far, have met with the general approval of the trade. It is believed that their use will afford a more satisfactory basis for trading in cotton and for spot quotations than has been possible heretofore. These practical forms are furnished, upon request, to any person, at a cost of \$25 for a complete set, or \$2.50 for each box contained in fractional parts of a set.

On July 1, 1916, there had been distributed to exchanges, dealers, merchants, cotton mills, agricultural colleges, and textile schools in the United States 614 full sets and 78 fractional parts of sets, and to foreign countries 19 full sets and 1 fractional part of a set of practical forms of the official cotton standards for grade, represented by white cotton. There had also been distributed in this country 31 full sets of practical forms of the official cotton standards for color. A complete list of the exchanges and similar organizations, having adopted the official standards as of July 1, 1916, follows:

Mobile Cotton Exchange, Mobile, Ala.  
 Montgomery Cotton Exchange, Montgomery, Ala.  
 Selma Cotton Exchange, Selma, Ala.  
 Little Rock Cotton Exchange, Little Rock, Ark.  
 Atlanta Commercial Exchange, Atlanta, Ga.  
 Augusta Cotton Exchange, Augusta, Ga.  
 Savannah Cotton Exchange, Savannah, Ga.  
 New Orleans Cotton Exchange, New Orleans, La.  
 New England Cotton Buyers' Association, Boston, Mass.  
 Fall River Cotton Buyers' Association, Fall River, Mass.  
 St. Louis Cotton Exchange, St. Louis, Mo.  
 Clarksdale Cotton Exchange, Clarksdale, Miss.  
 Greenville Cotton Exchange, Greenville, Miss.  
 Greenwood Cotton Exchange, Greenwood, Miss.  
 Vicksburg Cotton Exchange, Vicksburg, Miss.  
 Yazoo City Cotton Exchange, Yazoo City, Miss.  
 New York Cotton Exchange, New York, N. Y.  
 Cotton Manufacturers' Association, Charlotte, N. C.  
 Oklahoma State Cotton Exchange, Oklahoma, Okla.  
 Charleston Cotton Exchange, Charleston, S. C.  
 Cotton Manufacturers' Association, Greenville, S. C.  
 Memphis Cotton Exchange, Memphis, Tenn.  
 Dallas Cotton Exchange, Dallas, Tex.  
 Fort Worth Grain and Cotton Exchange, Fort Worth, Tex.  
 Galveston Cotton Exchange, Galveston, Tex.  
 Houston Cotton Exchange, Houston, Tex.  
 Paris Cotton Exchange, Paris, Tex.  
 San Antonio Cotton Exchange, San Antonio, Tex.  
 Waco Cotton Exchange, Waco, Tex.  
 Texas Cotton Buyers' Association, Waco, Tex.  
 Norfolk Cotton Exchange, Norfolk, Va.

In continuation of the work of standardization, tentative standards have been prepared by the department for cotton of the kind grown in Arizona. Demonstrations based on these standards have been conducted during the past two seasons in the Salt River Valley, and a report of this work has been published in Bulletin No. 311 of the Department of Agriculture, entitled "Handling and Marketing of the Arizona-Egyptian Cotton of the Salt River Valley."

Investigations are planned with a view to the establishment of standards representing specific lengths of staple, perished and immature staple, and gin-cut cotton. The physical effects of the various processes involved in ginning, baling, and compressing on the fiber of cotton are being investigated on a commercial scale.

A set of practical forms of the official cotton standards for grade, represented by white cotton, has been furnished to each field demonstration agent of the Department of Agriculture located in the South. Each of these sets has been placed in charge of the custodian selected by the county agent, where it will be accessible to farmers at all times. It will thus be possible for growers to ascertain the grade of their cotton, and it is believed that they will gradually learn the benefits to be derived from having this knowledge before their cotton is sold. Since practically all of the southern markets are now making quotations on the basis of the official cotton standards, the knowledge afforded by the use of these practical forms will render such quotations much more intelligible to the cotton farmer than they have been in the past. The department anticipates that it will be able to furnish the custodians with the quotations received from the spot markets, upon the basis of which they will be able to learn at all times approximately what is a just and equitable price for cotton in their respective communities.

Assistance has been given to farmers' organizations in Arkansas and North Carolina in the cooperative handling and marketing of their cotton, and this work is being enlarged during the present year to include certain sections of Texas, Georgia, and South Carolina.

\* A comprehensive survey of Texas and Oklahoma primary cotton markets has been conducted for the purpose of determining the relation between quality and price in the same market, in order to draw comparisons between different markets and between the primary markets and the ports of the United States.

Bales of cotton are being examined and tested in mills and textile schools, with a view to ascertaining the waste, tensile strength, and bleaching qualities of the various grades represented by the official cotton standards, in order to determine their relative commercial values. The results of these tests will be published in the near future. Spinning tests conducted during the seasons of 1913-14 and 1914-15, based on the tentative standards for Arizona cotton, have been completed and have been published in Bulletin No. 359 of the Department of Agriculture, entitled "Comparative Spinning Tests of Arizona-Egyptian with Sea Island and Sakellarides Egyptian Cottons."

Investigations relative to the marketing of cotton seed and its products are being made, primarily to ascertain the factors which influence or control the prices paid therefor, the advantages which may be secured by purchasers from marketing cotton seed cooperatively or through cooperative cotton-oil mills, and the uses to which cotton seed and its products are devoted. The locations of cottonseed-oil mills in the United States have been ascertained, and existing rules and customs relating to the grading, buying, and selling of cotton seed and its products have been compiled and are being studied, with the view of planning and promoting the use of uniform rules and standards for the handling of these products.

During the latter part of the fiscal year 1914 investigations were begun with a view to securing a complete list of all cotton-storage warehouses in certain states, including data in regard to the total storage capacity of such warehouses, charges for storage, rates of insurance on cotton stored in such warehouses, locations of the warehouses with reference to production and shipping centers, and other factors affecting cotton in storage. Some of the information collected has been tabulated and published in Bulletin No. 216 of the Department of Agriculture, entitled "Cotton Warehouses; Storage Facilities now Available in the South," and in Bulletin No. 277, "Cotton Warehouse Construction."

The warehouse act, approved August 11, 1916, as a part of the annual appropriation act for the Department of Agriculture,

## COTTON PRODUCTION AND DISTRIBUTION.

provides for the issuance by the Secretary of Agriculture of licenses for the conduct of warehouses in which cotton and certain other staple agricultural products may be stored, and for the bonding of such warehouses. The purpose of this legislation is to bring about the introduction into the channels of commerce of uniform warehouse receipts of such a reliable character as to be easily and widely negotiable. It is not, however, compulsory that any warehouseman be licensed by the Secretary of Agriculture. The system is wholly permissive. The necessary rules and regulations for carrying into effect the provisions of the act are now in course of preparation and will be published and distributed at the earliest practicable date.

## LONG-STAPLE COTTON.

The limited supply of cotton having a long staple, and the world-wide demand in normal times for cotton of this character for use in the manufacture of thread and the higher-grade fabrics, and recently of automobile tires, have given such varieties an importance seemingly out of proportion to the amount produced. While at one time long-fiber sea-island cotton grown in the West Indies provided a large part of the total cotton used in Europe, the world's production of this variety at the present time is comparatively insignifi-

cant, averaging less than 100,000 bales per annum. The quantity of long-fiber cotton produced in Egypt last year was less than a million bales, and the quantity of upland cotton with a staple of  $1\frac{1}{2}$  inches or more in length produced in the United States from the crop of 1915, according to the estimate of the Department of Agriculture, was about 825,000 bales. Long-staple cotton is also produced in comparatively small quantities in India, Brazil, Peru, and several other countries. Altogether the total of long-staple cotton—that is, cotton having a fiber of  $1\frac{1}{2}$  inches or more in length—produced throughout the world from the crop of 1915 did not, in all probability, exceed 2,000,000 bales. As stated above, great interest attaches to cotton of this character under normal conditions, and statistics more or less in detail are presented regarding its cultivation in the United States.

*Sea-island cotton.*—Table 13 is a comparative statement, showing by states the quantity of sea-island cotton ginned in the United States from the crops of 1911 to 1915, the average gross weight of the bale, and the quantity ginned to specified dates during these years.

TABLE 13.—SEA-ISLAND COTTON—PRODUCTION, AVERAGE GROSS WEIGHT OF BALE, AND QUANTITY GINNED TO SPECIFIED DATES, BY STATES: 1911 TO 1915.

STATE.	Growth year	PRODUCTION.		Average gross weight of bale (pounds).	COTTON GINNED TO (RUNNING BALES)—								
		Bales (number).	Total gross weight (pounds).		Sept. 1.	Sept. 25.	Oct. 18.	Nov. 1.	Nov. 14.	Dec. 1.	Dec. 13.	Jan. 1.	Jan. 16.
United States .....	1915	91,844	35,590,000	387.5	2,097	19,091	40,438	55,302	68,941	77,165	84,110	88,933	90,671
	1914	81,654	32,230,000	395.5	1,743	13,927	30,078	43,115	54,197	63,024	71,401	76,857	79,515
	1913	77,563	29,840,000	384.7	430	10,570	31,139	42,804	51,950	61,049	69,520	74,320	76,277
	1912	73,777	28,150,000	381.9	232	3,051	15,960	28,687	40,389	51,275	60,445	67,257	70,758
	1911	119,293	47,090,000	399.7	546	11,807	40,303	56,603	71,204	87,656	95,035	105,983	109,807
Florida .....	1915	28,094	10,470,000	372.7	378	5,405	12,881	17,841	22,532	24,914	26,721	27,715	27,959
	1914	33,662	12,739,000	379.6	602	5,927	13,738	19,142	23,751	27,531	30,488	32,305	33,221
	1913	25,537	9,250,000	361.3	140	4,049	12,259	16,353	19,542	22,207	24,125	25,160	25,866
	1912	22,234	8,270,000	370.4	167	1,630	6,976	11,067	15,052	17,826	19,505	21,035	21,916
	1911	41,270	15,430,000	375.4	233	4,381	15,110	21,038	26,518	32,350	35,585	38,091	39,340
Georgia .....	1915	57,572	22,960,000	393.7	1,713	13,637	26,938	36,145	44,156	48,877	52,927	55,631	56,723
	1914	42,395	17,490,000	412.6	1,146	7,907	15,884	23,096	28,800	33,091	37,395	39,090	41,204
	1913	43,305	17,500,000	404.1	295	6,443	17,303	24,570	29,355	34,346	39,014	41,768	42,650
	1912	43,736	17,220,000	393.6	64	1,258	5,148	16,276	22,673	29,756	35,418	39,543	41,529
	1911	72,904	30,400,000	417.0	313	7,405	24,453	33,841	41,730	51,496	58,008	63,099	65,377
South Carolina .....	1915	6,178	2,160,000	350.3	1	49	669	1,376	2,253	3,374	4,452	5,687	5,959
	1914	5,697	2,020,000	361.3	.....	93	456	877	1,646	2,402	3,518	4,553	5,690
	1913	8,671	3,090,000	356.7	.....	1	73	1,012	1,373	3,053	4,496	6,380	7,386
	1912	7,707	2,680,000	348.7	.....	1	109	836	1,544	2,464	3,693	5,222	6,629
	1911	5,110	1,803,000	350.6	.....	.....	21	740	1,634	2,656	3,810	4,442	4,798

The sea-island cotton crop of 1915 amounted to 91,844 running bales, or 35,590,000 pounds gross weight. While larger than any of the three preceding crops, it was smaller than that of 1911. More than one-half of the total crop of sea-island cotton in 1915 was ginned prior to November 1, and more than three-fourths prior to December 1.

The ginning of sea-island cotton in the three producing states from the crop of 1915 was confined to 44 counties, comprising 15 counties in Florida, 26 in Georgia, and 3 in South Carolina. It was not grown, however, in all parts of the counties from which it was returned, in some instances only a small proportion of the total production of cotton being sea-island. The distribution of the crop by counties for the last five

years will be found in Table 56, and the localities producing it in 1915 are represented on the map on page 32. It might be presumed that the high prices generally received for this cotton would cause a large increase in the acreage, but attempts to grow it in other parts of these states and in other states have been so unsatisfactory that practically all efforts to raise it outside of certain well-defined areas in the states named have been abandoned. Experiments in the growing of this cotton were made in Plaquemines Parish, La., and a few bales were produced there in 1911, 1912, and 1913. However, no sea-island cotton was returned for this parish in 1914 and 1915.

The best sea-island cotton produced in the United States is grown on the islands off the coast of South

Carolina by planters who have for many years paid the most careful attention to seed selection. The fiber produced is long and fine, and it is harvested and handled with such care that it commands a very high price. Growers who raise sea-island cotton in the interior must secure new seed from the coast region frequently in order to preserve the quality of the fiber, which degenerates rapidly into upland fiber when grown away from the coast. Aside from the consideration of suitable soil and climatic conditions, there are obstacles in the way of extending this culture beyond the present limits. Among these are: (1) Lack of proper experience in new territory in cultivating, harvesting, and handling; (2) objection to the small and partially closed sea-island bolls on the part of the pickers accustomed to upland varieties, notwithstanding the fact that they receive more for picking sea-island cotton than for picking upland cotton; (3) the necessity of using roller gins for sea-island cotton, since saws injure the fiber; and (4) the disadvantage of selling sea-island cotton in a market where the buyers are unaccustomed to it.

The sea-island cotton now being grown in the West Indies is said to surpass the average American product, and competes with that grown in South Carolina rather than with the less valuable varieties grown in Florida and Georgia. However, the total exports of sea-island cotton from the British West Indies for the year ending September 30, 1914, were only 3,810 bales of 500 pounds each. The growing of sea-island cotton in Santo Domingo has been attempted several times. It is stated that the regions in the vicinity of Puerta Plata are well suited to cotton growing and that there will be considerable development in this section.

*Egyptian cotton.*—The fiber of Egyptian cotton is not so strong nor so fine as that of sea-island, but it is nevertheless quite strong and of uniform length. It is prepared for market more carefully than most of the American fiber, and, being freer from waste, is more satisfactory on that account to the manufacturer. The imports of Egyptian cotton into the United States during the year ending July 31, 1916, amounted to 350,796 bales of 500 pounds each. The demand for Egyptian cotton by American manufacturers has led to efforts to grow in the United States cotton having its characteristics, and some encouragement has been given the movement by the success attending its culture in Arizona.

The status of the cultivation of Egyptian varieties of cotton in this country is presented in the following statement, prepared by the Department of Agriculture:

The abnormally low prices of 1914 caused a greatly diminished acreage to be planted to Egyptian cotton in Arizona in 1915. The total production last year amounted to only about 1,100 bales of 500 pounds each. This small crop sold at a much better price than in 1914, and consequently the acreage planted in 1916 increased to about 7,000 acres. A crop of about 4,000 bales is anticipated this year. The improvement in methods of production which is taking place as the farmers of the Salt River valley become better acquainted with this crop will probably result in larger average yields per acre than have previously been obtained.

Exceedingly high prices are now being paid for Egyptian cotton, especially for the Sakellarides variety, with which the Arizona product is expected to compete. The imports of cotton from Egypt into the United States during the past year have been exceedingly heavy, the increase being due largely to the unprecedented demand for automobile tire fabrics. Although data are lacking for a close estimate, it seems reasonable to conclude that at least 25 per cent of the total imports have been of the Sakellarides variety, which averages about 1½ inches in staple. In view of the strong demand for the type of cotton with which the Arizona product is most nearly in competition, the prospects for the permanent establishment of the Egyptian cotton industry in that state are better than ever before.

*Long-staple upland cotton.*—Formerly practically all of the long-staple upland cotton produced in the United States was grown in the Mississippi delta, where a market for handling cotton of this character had been created. With the increased demand for superior staple cottons, efforts were made in other sections of the cotton belt to grow improved varieties of upland cotton. This movement was accelerated by the fact that early-maturing varieties of short-staple cotton supplanted in a measure the long-staple varieties grown in the delta, where these later-maturing cottons were seriously damaged by the boll weevil. The net result has shown no pronounced increase in the quantity of long-staple upland cotton produced in the country, notwithstanding the efforts of those interested in this movement.

Complete data of the production of long-staple upland cotton are not available, and opinions as to the total amount vary greatly. The Bureau of Crop Estimates, of the Department of Agriculture, made an inquiry to determine what percentage of the total crop of 1915 was upland long staple, where this staple was principally produced, and the yields and selling prices compared with short-staple cotton. The results of this inquiry appear in the *Monthly Crop Report*, issued June 17, 1916, from which the following information is obtained:

Reports from about 5,000 cotton correspondents of the bureau were considered in preparing the percentages shown in the following statement of long-staple (1½ inches and over), short-staple (under 1½ inches), and sea-island cotton produced in 1915, with the yields secured and the prices obtained for each:

UPLAND LONG-STAPLE, SHORT-STAPLE, AND SEA-ISLAND COTTON—RELATIVE PRODUCTION, YIELDS PER ACRE, AND PRICES: 1915.

STATE.	PERCENTAGE OF TOTAL CROP.			YIELD OF LINT PER ACRE.			AVERAGE PRICE PER POUND.		
	Long staple.	Short staple.	Sea is-land.	Long staple.	Short staple.	Sea is-land.	Long staple.	Short staple.	Sea is-land.
United States..	P. ct. 7.4	P. ct. 91.9	P. ct. 0.7	Lbs. 178	Lbs. 179	Lbs. 149	Cts. 13.4	Cts. 11.8	Cts. 22.6
Alabama.....	1.8	98.2	.....	155	148	.....	13.0	11.2	.....
Arizona.....	95.0	5.0	.....	250	350	.....	.....	.....	.....
Arkansas.....	14.4	85.6	.....	170	176	.....	13.3	11.5	.....
California.....	20.0	80.0	.....	400	400	.....	16.0	12.0	.....
Florida.....	1.0	55.0	44.0	130	140	123	12.5	10.9	23.0
Georgia.....	2.0	95.5	2.5	200	194	160	13.5	11.3	22.0
Louisiana.....	2.2	97.8	.....	150	158	.....	12.7	11.2	.....
Mississippi.....	23.1	76.9	.....	155	175	.....	14.6	11.4	.....
Missouri.....	20.0	80.0	.....	240	245	.....	12.0	11.0	.....
North Carolina.....	2.0	98.0	.....	260	270	.....	13.8	11.3	.....
Oklahoma.....	13.5	86.5	.....	163	154	.....	11.9	11.5	.....
South Carolina.....	8.0	91.5	0.5	228	232	145	15.3	11.3	25.0
Tennessee.....	7.0	93.0	.....	170	182	.....	13.0	11.2	.....
Texas.....	6.2	93.8	.....	165	147	.....	11.9	11.3	.....
Virginia.....	1.0	99.0	.....	200	212	.....	14.0	11.5	.....



The production of long-staple upland cotton,  $1\frac{1}{2}$  inches and upward, is estimated at 7.4 per cent of the total, equivalent to about 825,000 bales for the United States as a whole. The states of heaviest production are as follows: Mississippi, 220,000 bales; Texas, 200,000 bales; Arkansas, 118,000 bales; South Carolina, 91,000 bales; and Oklahoma, 86,000 bales.

In the sections devoted to the production of the recognized varieties of long-staple cotton, there was in 1915 a general increase in its relative production, and in Mississippi the increase was also absolute and material. The wide introduction through the delta section of Mississippi of vigorous and early-fruited varieties of long staple, some of which succeed as well as short staple under boll-weevil conditions, has revived and given increased impetus to the production of long staple, which had, prior to 1915, steadily declined, following the arrival of the boll weevil, and seemed, for a time, to be threatened by total extinction.

From a study of the returns, it appears that the proportion of  $1\frac{1}{2}$ -inch cotton to all long staple is about half in South Carolina, materially less than half in Arkansas, while in Texas and Oklahoma, where relatively little attention has been given to the question of length of staple, the bulk of cotton ranking as long staple is of the length of  $1\frac{1}{2}$  inches. The variations may be better understood from the fact that in the Southeastern states, in Mississippi, and in a portion of Arkansas, the production of long-staple upland is largely the result of conscious effort, working with distinctly long-staple varieties, whereas in Texas, Oklahoma, and portions of the adjoining cotton states, the superior staples are, in the main, not grown from special long-staple varieties, but are merely good length lint of ordinary varieties of cotton grown under favorable conditions. This phenomenon is strikingly observed in Mississippi, where the same variety that gives a length of staple distinctly under 1 inch in the thin hill lands of that state will, in the rich delta section, give a length of up to  $1\frac{1}{4}$  inches.

The principal areas of production of long staple appear to be the delta lands, extending through western and northwestern Mississippi, northeastern Louisiana, eastern and southeastern Arkansas, and into Tennessee; groups of counties in northeastern and in east-central Texas; the counties of Darlington, Chesterfield, Lee, and Marlboro in northern South Carolina, with some extension into the counties across the line in North Carolina; a group of counties along the Savannah River in Georgia and South Carolina; and small groups, or isolated counties, elsewhere.

The reports on yield per acre of long staple and short staple were not uniform, although, when averaged, showing short staple as the heaviest yielder by a slight margin in most of the States, including those in which the commercial production of long staple is prominent. To the contrary, the long staple appears to be the heaviest yielder in the important cotton states of Georgia, Alabama, Texas, and Oklahoma, in which the production of long staple is rather incidental, coming largely from the good varieties of ordinary short staple grown in good land. In fact, any comparison of the average yield of long staple with short staple must always take into consideration the fact that the long staple is regularly the product of the better farms.

The average price shows a margin of over 2 cents per pound for long-staple upland over that received for short staple. The greatest margin of difference is in the states of Mississippi and South Carolina, where greatest attention is given to the production of distinct long-staple varieties, for which a premium of 5 cents or over per pound is frequently realized. In those sections where special attention is given to length of staple and this factor is recognized and considered in fixing cotton values, the difference is always material. As might be expected, the price is found to be less where the factor of length has not been given due consideration in fixing the value, and where the excess length is not marked, as when the great bulk of such long staple is  $1\frac{1}{2}$  inches, this condition being met with particularly in Oklahoma and Texas.

Judging by the returns from this and last year's inquiry, profit to the average farmer in growing long-staple cotton, assuming, first, the possession of the essential natural factors of suitable soil, climate,

seed, etc., seems to be dependent largely on the possibility of concerted action by a considerable body of neighboring cotton growers; in other words, upon community action, by which cooperation suitable ginning facilities may be provided, deterioration of seed guarded against, the difficulties of the labor problem minimized, and, possibly, most important of all, the problem of marketing the long staple can be minimized, if not solved.

The new long-staple varieties developed by the specialists in the Bureau of Plant Industry now figure for the first time in the statistics. They are earlier and more productive than the varieties that furnished the long-staple crop before the boll weevil came. They have the same habits of growth as short-staple varieties, mature in the same period, and can be grown to advantage in many districts which have been limited in the past to short staples. The new early-maturing varieties make it possible not only to continue the planting of long-staple cotton in the former centers, but to extend and stabilize the production of upland long staple in new districts.

The chief difficulty that attends the establishment of long-staple production in new districts is the lack of an effective system of maintaining the supply of pure seed. It is only in communities regularly organized for the purpose that adequate supplies of pure seed are likely to be maintained. Accordingly special efforts are being made to establish the cultivation of the new varieties, as far as possible, in well-organized communities. The manufacturers, as well as the farmers, should be interested in this effort, since it is only in such communities that a regular production of superior fiber is to be expected. While other districts may be able to produce good fiber when pure seed is planted, there is no prospect of continued production of superior fiber where long and short staple varieties are planted indiscriminately and sent to the same gins.

#### NUMBER OF GINNERIES.

The number of ginneries, both active and idle, reported for each year from 1911 to 1915, and the average number of running bales ginned per active establishment, are shown, by states, in Table 14.

Notwithstanding the decided increase in the quantity of cotton ginned from the crops of 1911, 1912, 1913, and 1914, as compared with previous years, the total number of active ginneries has been decreasing. This tendency was emphasized by the comparatively small crop of 1915. Excepting California, each of the states reported a decrease, as compared with 1914, Texas showing a loss of 268, Alabama 222, Georgia 158, Mississippi 155, South Carolina 112, and Arkansas and North Carolina each 111.

The average number of bales ginned per establishment was 478 in 1915, 648 in 1914, 567 in 1913, 535 in 1912, and 592 in 1911, the size of the crop necessarily affecting the average. As a result of the more general use of larger and more modern ginneries in the newer portions of the cotton belt, the average number of bales ginned per establishment is naturally larger for these sections.

It is the practice of the bureau to retain on the official list and to class as "idle" all establishments which contain the machinery necessary for ginning, and which may be operated at some future time, and to drop from the list as "dismantled" only those not properly equipped with ginning machinery. This, in part, accounts for the relatively large number of idle establishments. The numbers of active and of idle ginneries in each county are shown in Table 57.

# COTTON PRODUCTION IN THE UNITED STATES.

TABLE 14.—NUMBER OF ACTIVE AND IDLE GINNERIES, AND AVERAGE NUMBER OF RUNNING BALES, EXCLUDING LINTERS, GINNED PER ACTIVE ESTABLISHMENT, BY STATES: 1911 TO 1915.

STATE.	Growth year.	NUMBER OF GINNERIES.			Average number of running bales ginned per active establishment.	STATE.	Growth year.	NUMBER OF GINNERIES.			Average number of running bales ginned per active establishment.
		Total.	Active.	Idle.				Total.	Active.	Idle.	
United States.....	1915	26,721	23,162	3,559	478	Missouri.....	1915	108	90	18	518
	1914	27,339	24,547	2,792	648		1914	112	98	14	800
	1913	27,649	24,749	2,900	567		1913	114	102	12	625
	1912	28,358	25,279	3,079	535		1912	113	103	10	520
	1911	29,225	26,349	2,876	592		1911	108	105	3	868
Alabama.....	1915	3,132	2,753	379	373	North Carolina.....	1915	2,874	2,511	360	293
	1914	3,233	2,975	258	582		1914	2,938	2,625	313	370
	1913	3,252	2,989	263	498		1913	2,988	2,715	273	308
	1912	3,417	3,130	287	426		1912	3,066	2,810	256	323
	1911	3,569	3,295	274	516		1911	3,125	2,897	228	389
Arkansas.....	1915	1,975	1,789	206	446	Oklahoma.....	1915	1,117	965	152	645
	1914	2,036	1,880	156	532		1914	1,143	1,062	81	1,161
	1913	2,080	1,923	157	541		1913	1,151	1,035	116	834
	1912	2,140	1,921	219	402		1912	1,153	1,051	102	977
	1911	2,232	2,019	213	450		1911	1,129	1,068	61	970
California.....	1915	20	14	6	2,042	South Carolina.....	1915	3,401	3,009	392	383
	1914	16	14	2	3,455		1914	3,467	3,181	286	490
	1913	9	9	0	2,490		1913	3,466	3,216	250	441
	1912	10	8	2	992		1912	3,532	3,258	274	376
	1911	9	7	2	1,402		1911	3,567	3,381	230	508
Florida.....	1915	261	203	58	273	Tennessee.....	1915	624	562	62	527
	1914	263	220	43	412		1914	627	575	52	647
	1913	286	221	65	302		1913	639	565	74	649
	1912	303	247	56	238		1912	666	584	82	458
	1911	310	276	34	342		1911	666	603	63	713
Georgia.....	1915	4,262	3,704	558	523	Texas.....	1915	4,610	4,093	517	750
	1914	4,338	3,862	476	705		1914	4,694	4,361	333	1,007
	1913	4,351	3,867	484	607		1913	4,695	4,352	343	872
	1912	4,514	3,993	521	454		1912	4,607	4,300	307	1,033
	1911	4,727	4,254	473	657		1911	4,591	4,260	331	970
Louisiana.....	1915	1,437	1,086	351	310	Virginia.....	1915	145	121	24	135
	1914	1,489	1,187	302	331		1914	153	133	20	190
	1913	1,525	1,198	327	365		1913	154	134	20	183
	1912	1,599	1,132	467	332		1912	153	135	18	189
	1911	1,675	1,233	442	310		1911	149	131	18	237
Mississippi.....	1915	2,738	2,204	534	420	All other states <sup>1</sup> .....	1915	17	15	2	464
	1914	2,814	2,359	455	516		1914	16	15	1	888
	1913	2,923	2,400	514	520		1913	16	14	2	676
	1912	3,070	2,598	472	387		1912	15	9	6	345
	1911	3,357	2,864	493	408		1911	11	6	5	1,157

<sup>1</sup>Includes Arizona, Kansas, Kentucky, and New Mexico.

### ACREAGE AND PRODUCTION.

Table 15 shows, by states, for selected years, the cotton acreage harvested, together with the production of cotton. The estimated acreage planted in 1916 is also given.

According to the revised estimate of the Department of Agriculture, the area planted in cotton in 1915 was 32,107,000 acres, of which 695,000 acres, or 2.2 per cent, were abandoned, leaving 31,412,000 acres as the area from which the crop was harvested. This is the smallest acreage for any crop since 1907 and was occasioned by the demoralized state of the cotton market following the outbreak of the European war. The average production of lint per acre in 1915, as estimated by the Department of Agriculture, was 170 pounds, which compares with 209 pounds in 1914, 182 pounds in 1913, 191 pounds in 1912, and 208 pounds in 1911. The average yield per acre in North Carolina in 1915 was 260 pounds, in Missouri 240 pounds, in South Carolina 215 pounds, in Georgia, 189 pounds, and in California, where cotton is grown on irrigated

land, 380 pounds. In Oklahoma the average was only 162 pounds, compared with 212 pounds in 1914. When conditions are favorable the yield of cotton in some localities approaches a bale to the acre. This is largely the result of improved cultural methods, which involve thorough preparation of the soil, the use of commercial fertilizers, rotation of cotton with leguminous crops, and frequent and intelligent cultivation. With the more general adoption of intensive farming there may be a large increase in production without any general extension of acreage.

In 1839 cotton was grown in Delaware, Maryland, Indiana, and Illinois, the last-named state alone producing more than 5,000 bales. Under the stimulus of the high prices following the Civil War, cotton was grown to a limited extent in West Virginia, Nevada, California, Illinois, and Utah, in all of which states its cultivation subsequently ceased. New Mexico, which produced more than 7,000 pounds of cotton in 1859, and afterwards abandoned its culture, has again established the industry, while California, as previously stated, has also resumed the cultivation of cotton.



LOCALIZATION OF COTTON GINNING.

The cotton crop of 1915 was ginned in 886 counties, that of 1914 in 897, that of 1913 in 888, and that of 1912 in 877. In several instances there were counties in which the ginneries were active for one crop and idle

for another, this fact accounting, in part, for the differences in the number of counties for the different crops. Table 16 gives the number of counties, by states, from which cotton ginning was reported, and classifies the counties according to the total quantities returned by the ginneries.

TABLE 16.—COTTON-PRODUCING COUNTIES, CLASSIFIED ACCORDING TO QUANTITY OF COTTON GINDED, BY STATES: 1911 TO 1915.

STATE.	Growth year.	NUMBER OF COUNTIES GINNING—						STATE.	Growth year.	NUMBER OF COUNTIES GINNING—							
		Total.	Less than 5,000 bales.	5,000 to 10,000 bales.	10,000 to 15,000 bales.	15,000 to 25,000 bales.	25,000 to 40,000 bales.			40,000 bales and over.	Total.	Less than 5,000 bales.	5,000 to 10,000 bales.	10,000 to 15,000 bales.	15,000 to 25,000 bales.	25,000 to 40,000 bales.	40,000 bales and over.
United States	1915	886	308	164	124	175	79	36	Missouri	1915	11	8	1	1	1		
	1914	897	245	117	112	179	159	85		1914	11	8		1	1	1	
	1913	888	265	143	117	174	127	62		1913	11	8	1		1	1	
	1912	877	264	145	129	173	109	57		1912	10	7	1	1		1	1
	1911	883	243	119	122	178	137	84		1911	11	7	1		1	1	1
Alabama	1915	67	8	13	15	22	9		North Carolina	1915	74	30	19	8	11	5	1
	1914	67	4	2	7	19	28	7		1914	73	23	17	12	7	12	2
	1913	67	3	7	7	23	24	3		1913	75	27	21	9	8	9	1
	1912	67	3	6	13	22	20	3		1912	75	27	18	10	8	11	1
	1911	67	3	3	8	22	23	8		1911	74	21	17	11	11	8	6
Arkansas	1915	71	22	19	8	14	6	2	Oklahoma	1915	62	19	15	10	15	3	
	1914	71	16	13	14	20	4	4		1914	66	18	5	4	16	16	7
	1913	71	13	18	11	19	6	4		1913	63	15	9	14	16	8	1
	1912	71	18	17	15	17	4			1912	63	17	5	9	20	10	2
	1911	71	16	14	17	17	5	2		1911	66	16	10	6	21	11	2
Florida	1915	24	22	1	1				South Carolina	1915	44	3	3	5	11	17	5
	1914	24	17	6		1				1914	44		3	2	9	17	13
	1913	24	23			1				1913	44	1	3	2	12	16	10
	1912	24	23			1				1912	44	1	5	5	11	16	6
	1911	24	19	4		1				1911	43		3		9	13	18
Georgia	1915	147	29	31	31	42	12	2	Tennessee	1915	34	16	5	6	6		1
	1914	148	22	17	25	43	33	8		1914	33	13	4	6	4	5	1
	1913	143	24	19	32	41	21	6		1913	32	12	8	1	5	5	1
	1912	142	26	38	32	36	10			1912	32	16	8	4	6		1
	1911	140	20	15	22	41	31	11		1911	33	13	4	5	4	6	1
Louisiana	1915	51	27	11	5	7	1		Texas	1915	204	72	29	25	37	20	21
	1914	53	25	7	11	8	2			1914	211	55	20	19	39	33	36
	1913	54	27	10	7	5	4	1		1913	200	69	35	21	30	25	29
	1912	52	27	9	9	5	1	1		1912	204	58	28	18	30	33	37
	1911	52	27	9	7	8	1			1911	209	70	24	31	23	31	30
Mississippi	1915	78	35	16	9	9	5	4	All other states	1915	19	17	1			1	
	1914	78	31	10	11	12	8	6		1914	18	13	4				1
	1913	77	29	9	13	12	8	6		1913	18	14	3		1		
	1912	76	27	10	13	17	3	6		1912	17	14	3				
	1911	77	19	11	15	20	7	5		1911	16	12	4				

Of the total number of counties reporting cotton ginned from the crop of 1915, 308 returned less than 5,000 equivalent 500-pound bales each, as compared with 245 from the crop of 1914, 265 from the crop of 1913, 264 from the crop of 1912, and 243 from the crop of 1911. For many of these counties the quantity of cotton reported is small, in some cases only one or two ginneries being operated in a county. There were 115 counties which reported more than 25,000 bales in 1915, of which 20 reported more than 50,000 bales each, 6 more than 75,000 bales each and 2—Bolivar County, Mississippi, and Ellis County, Texas—more than 100,000 bales each.

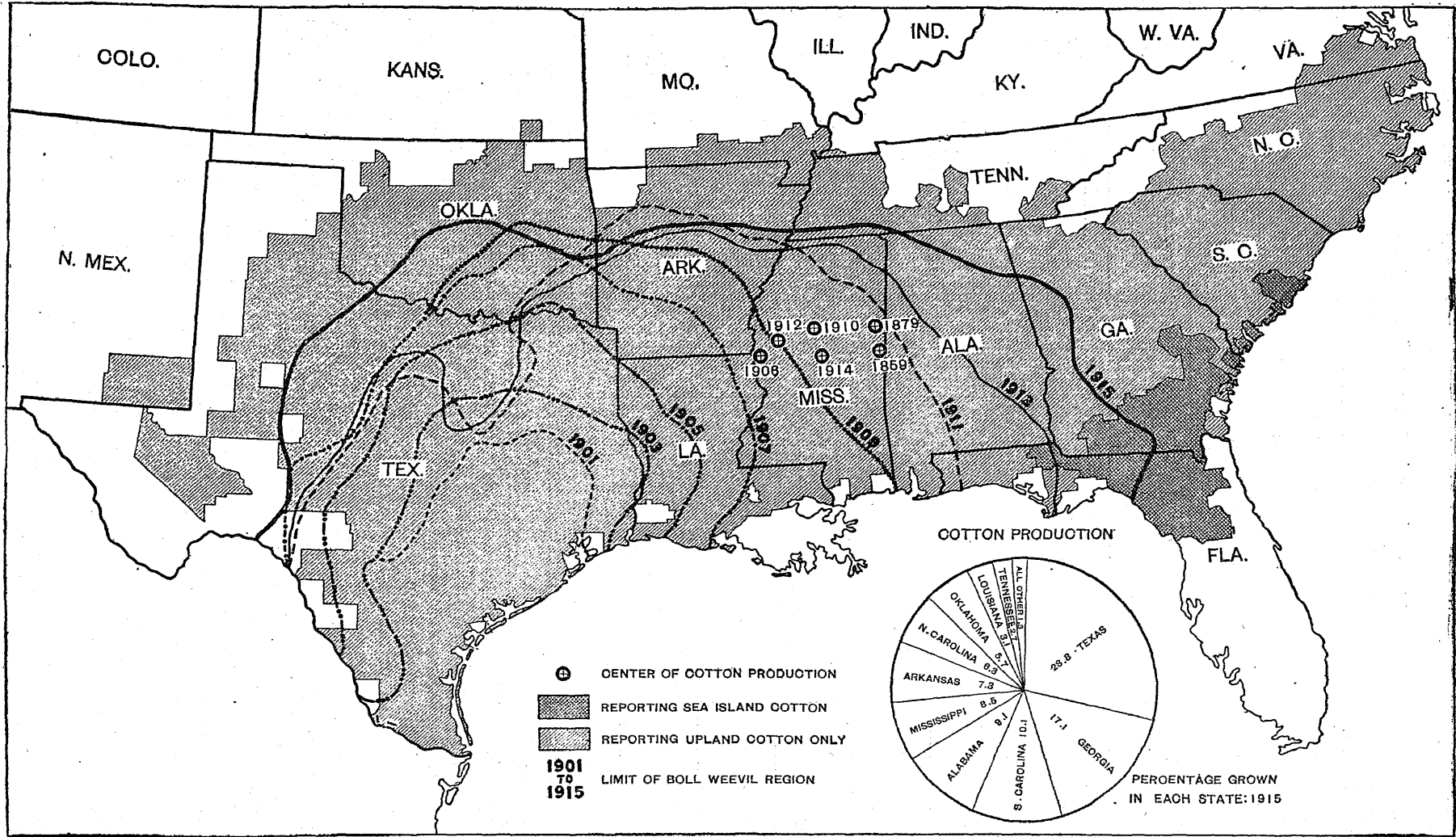
The counties reporting cotton ginned are indicated on the United States map on page 32, while on the state maps (pp. 91 to 99, inclusive) the counties ginning cotton are designated according to the production in 500-pound bales.

Table 56 shows the quantity of sea-island cotton ginned to December 13 and for the season, by counties, Table 57 gives similar data for sea-island and upland cotton combined, as well as the numbers of active and idle ginneries, and Table 58 presents statistics of cotton ginned to specified dates and throughout the season. Linters are not included in these tables.

MAP 1.—COTTON-PRODUCING AREA OF THE UNITED STATES IN 1915, AND CENTER OF PRODUCTION: 1859-1914.

The cotton-producing area of the United States, as shown by the returns of ginner, is indicated on the map below. Localities producing upland cotton only are represented by diagonal lines, and those producing sea-island or both sea-island and upland, by intercrossed lines. On pages 91 to 99 will be found maps of the principal cotton-producing states, upon which are indicated the relative quantities of cotton produced by counties in 1915.

The centers of production in the United States for the crops of 1859, 1879, 1906, 1910, 1912, and 1914 are indicated on the map below. The center of production in 1859 was approximately 13 miles southeast of Macon, in Noxubee County, Miss.; in 1879 it was 11 miles south of Columbus, in Lowndes County; in 1906 it was 5 miles northeast of Mayersville, in Issaquena County; in 1910 it was 3 miles southwest of Vaiden, in Carroll County; in 1912 it was in Sharkey County, 2 miles north of Midnight; and in 1914 it was 1 mile northwest of Sharpsburg, Madison County.



# CONSUMPTION AND STOCKS OF COTTON.

The collection of statistics of cotton consumed and of cotton held was inaugurated by this bureau in 1905, in compliance with the joint resolution of Congress approved February 9, 1905, which authorized that these data be published as of the 12 months ending August 31. The joint resolution approved March 2, 1909, authorized the collection and publication of similar data for periods ending with August, October, December, and February, while the act of Congress approved July 22, 1912, required that statistics of this character be collected for each calendar month. In accordance with this legislation, yearly reports were published from 1905 to 1909,

four periodical reports each year from 1909 to 1912, and monthly reports have been published since September, 1912.

Table 17 presents comparative statistics for the United States for the years 1906 to 1916 and by states for 1912 to 1916 as to the number of cotton spindles, both total and active, the number of spindles consuming cotton mixed with other fibers, the quantity of domestic and foreign cotton consumed during the cotton year, and the quantity of domestic and foreign cotton held in consuming establishments at the end of the year. It also shows the quantity of linters consumed and held.

TABLE 17.—SPINDLES, RAW COTTON AND LINTERS CONSUMED, AND STOCKS HELD IN CONSUMING ESTABLISHMENTS: UNITED STATES, 1906 TO 1916, AND BY STATES, 1912 TO 1916.

[The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31.]

STATE.	Year.	COTTON SPINDLES.			Spindles consuming cotton mixed with other fibers.	COTTON (EXCLUSIVE OF LINTERS).						LINTERS.	
		Cotton Spindles		Consumed (bales).		Stocks in consuming establishments at end of year (bales).			Consumed (bales).	Stocks in consuming establishments at end of year (bales).			
		Total.	Active.			Total.	Domestic.	Foreign.			Total.	Domestic.	Foreign.
United States.....	1916	33,333,176	32,805,853	405,000	6,397,613	6,080,618	316,995	1,632,245	1,489,727	142,518	880,916	100,441	
	1915	32,840,730	31,904,235	394,505	5,597,362	5,375,305	222,057	1,401,185	1,292,403	108,782	411,845	198,905	
	1914	32,744,012	32,107,572	414,058	5,577,408	5,383,099	194,309	675,873	611,724	64,149	307,325	75,346	
	1913	32,149,617	31,519,796	454,733	5,483,321	5,250,392	232,929	717,704	637,725	79,979	303,009	60,454	
	1912	31,582,679	30,578,528	500,206	5,129,346	4,921,683	207,663	818,024	733,248	84,776	238,237	52,622	
	1911	30,803,662	29,522,597	456,242	4,498,417	4,322,987	175,430	498,769	417,345	81,424	206,561	43,422	
	1910	28,929,093	28,266,862	.....	4,621,742	4,465,968	155,774	493,010	450,673	42,337	149,185	38,183	
	1909	28,573,435	28,018,305	558,792	5,091,534	4,929,796	161,738	868,909	802,346	66,563	149,185	38,183	
	1908	27,964,387	27,505,422	602,340	4,539,090	4,389,642	149,448	594,184	531,881	62,303	(1)	(1)	
	1907	26,939,415	26,375,191	651,251	4,984,936	4,844,568	140,368	1,016,738	936,918	79,820	(1)	(1)	
	1906	25,811,681	25,250,096	.....	4,909,279	4,770,804	138,475	689,471	640,353	40,118	(1)	(1)	
Alabama.....	1916	1,126,846	1,111,660	.....	346,233	346,185	48	70,740	70,740	.....	6,032	1,076	
	1915	1,075,859	1,028,036	.....	297,277	297,229	48	59,631	59,583	48	4,268	672	
	1914	1,058,085	1,029,100	.....	287,335	287,096	239	17,493	17,340	93	6,027	1,328	
	1913	1,000,080	993,580	.....	294,420	294,122	298	23,106	23,079	27	5,504	753	
	1912	985,968	960,416	.....	262,544	262,109	435	21,647	21,512	135	4,645	578	
Connecticut.....	1916	1,362,186	1,343,573	38,648	144,582	124,755	19,827	64,539	54,199	10,340	28,661	3,285	
	1915	1,335,282	1,319,920	44,708	132,701	114,285	18,416	47,142	36,812	10,330	22,375	21,141	
	1914	1,340,482	1,317,203	45,708	134,839	119,221	15,618	36,036	28,624	7,412	17,015	8,105	
	1913	1,308,650	1,276,832	45,998	126,948	105,225	21,723	39,165	31,681	7,584	18,329	7,761	
	1912	1,307,907	1,249,593	44,076	125,199	105,445	10,750	35,512	24,758	8,754	17,547	6,563	
Georgia.....	1916	2,275,929	2,259,855	6,360	197,789	789,255	8,534	178,675	169,498	9,177	17,602	2,530	
	1915	2,178,573	2,148,133	11,610	659,853	654,287	5,566	160,280	156,287	3,993	13,373	5,092	
	1914	2,160,571	2,130,840	11,610	632,332	629,425	2,907	33,934	32,411	1,523	18,340	4,384	
	1913	2,103,018	2,071,910	11,610	631,081	627,693	3,388	37,853	35,681	2,172	17,050	3,840	
	1912	2,085,238	1,945,772	16,608	648,567	544,647	3,920	35,811	35,580	225	16,850	2,702	
Illinois.....	1916	58,168	56,568	1,069	13,007	12,914	93	4,715	4,693	22	10,070	1,378	
	1915	58,168	56,568	1,069	11,010	10,922	88	3,405	3,368	37	27,467	4,891	
	1914	58,168	56,568	1,069	10,938	10,867	71	1,322	1,292	30	23,021	4,584	
	1913	52,824	50,957	3,000	10,205	10,159	46	1,425	1,412	13	26,886	2,179	
	1912	48,444	48,444	3,000	8,100	8,071	29	1,528	1,510	9	10,731	2,054	
Indiana.....	1916	88,668	86,044	6,880	18,509	18,469	40	4,672	4,661	11	7,200	1,050	
	1915	94,032	85,816	6,695	18,969	18,905	64	7,069	7,018	51	8,973	3,661	
	1914	94,032	86,032	6,461	16,941	16,895	76	2,279	2,250	29	5,850	1,140	
	1913	94,032	90,032	5,649	17,350	17,290	60	3,927	3,915	12	5,878	719	
	1912	130,656	91,656	6,800	18,413	18,384	29	2,602	2,602	15	3,382	695	
Kentucky.....	1916	87,944	87,944	.....	25,569	25,569	.....	7,429	7,429	.....	872	165	
	1915	93,828	93,828	.....	25,498	25,498	.....	7,830	7,830	.....	4,188	2,332	
	1914	97,759	97,759	.....	24,657	24,657	.....	2,724	2,724	.....	2,844	803	
	1913	96,140	94,936	.....	24,453	24,453	.....	2,545	2,545	.....	2,257	691	
	1912	93,628	92,424	.....	25,033	25,033	.....	2,939	2,939	.....	2,306	841	
Louisiana.....	1916	79,503	59,563	.....	30,508	30,508	.....	1,201	1,201	.....	630	26	
	1915	79,763	56,195	.....	26,753	26,753	.....	171	171	.....	1,822	222	
	1914	86,095	38,764	.....	15,992	15,992	.....	221	221	.....	2,324	337	
	1913	86,095	36,683	.....	13,545	13,545	.....	70	70	.....	2,500	250	
	1912	86,088	36,676	.....	12,954	12,954	.....	170	170	.....	2,197	93	
Maine.....	1916	1,108,790	1,090,066	12,868	193,534	188,751	4,783	62,945	59,667	3,278	179	36	
	1915	1,104,209	1,079,503	10,628	176,088	172,632	3,456	53,018	50,203	2,715	168	12	
	1914	1,117,228	1,112,716	13,504	181,262	178,332	2,930	27,173	25,481	1,692	61	21	
	1913	1,096,986	1,078,394	11,952	175,240	172,743	2,497	27,758	26,571	1,187	31	11	
	1912	1,052,674	1,047,466	16,376	166,537	164,381	2,156	30,072	29,083	989	13	2	

<sup>1</sup> Linters consumed and on hand included under cotton. Separate statistics not available.



SPINDLES.

The term "cotton spindles" is applied to all spindles used for spinning cotton only, regardless of the character of the establishments in which located, and therefore does not include those which consumed a mixture of cotton and other fibers. The total number of cotton spindles returned for the United States was 33,333,176. The number operated during the year ending July 31, 1916, as shown in Table 17, was 32,805,883, or 841,648 more than the number for the previous year. There were 527,293 spindles returned as idle—that is, as having consumed no cotton whatever during the year. This number compares with 876,495 in 1915, 636,440 in 1914, and 1,004,151 in 1912. Of the idle cotton spindles reported in 1916, 159,460 were in plants not operated during the year and 367,833 in mills which consumed some cotton. The number of idle spindles included a small number of new spindles which had been installed before the close of the year, but which had not been brought into service.

In the total number of cotton spindles Massachusetts exceeds every other state, having 11,104,810, or 33.3 per cent of the total for the United States, in 1916; South Carolina ranks second, with 4,743,193, or 14.2 per cent; North Carolina third, with 4,053,206, or 12.2 per cent; Rhode Island fourth, Georgia fifth, New Hampshire sixth, Connecticut seventh, Alabama eighth, and Maine ninth. No other state reported as many as a million spindles. The states showing the largest net gains during the year were Massachusetts, North Carolina, Georgia, and Alabama, in the order named.

In addition to the spindles designed primarily to spin cotton, 405,000 spindles were returned as having consumed during the year raw cotton mixed with other fibers. The corresponding numbers for previous years were 394,505 in 1915; 414,058 in 1914; 454,733 in 1913; and 500,206 in 1912. The variations in the number of spindles so used is due to the fact that, in some establishments, spindles employed during one year in spinning cotton mixed with some other fiber use no raw cotton whatever during another year. Attention is also called to the fact that a few establishments did not report the number of spindles of this character, stating that the data were not available. The states reporting the largest numbers of spindles that consumed raw cotton mixed with other fibers are those which led in the manufacture of woolen goods and hosiery and knit goods. Of the total number of such spindles reported, 97,572, or 24.1 per cent, were returned from Pennsylvania, 61,324 from Massachusetts, 59,740 from New York, and 38,648 from Connecticut.

*Localization of cotton spinning.*—The importance of the cotton-spinning industry in certain localities is shown by the following table. This table gives the total number of spindles in each county having more

than 100,000 producing cotton spindles, the counties being arranged in the order of their importance in this respect.

TABLE 18.—COUNTIES IN THE UNITED STATES HAVING MORE THAN 100,000 COTTON SPINDLES EACH, ARRANGED IN ORDER OF NUMBER OF SPINDLES: 1916.

COUNTY.	Spindles (number).	COUNTY.	Spindles (number).
Bristol, Mass.	7,197,375	Pickens, S. C.	207,556
Providence, R. I.	1,665,427	Fulton, Ga.	199,104
Middlesex, Mass.	1,075,908	Aiken, S. C.	191,680
Hillsborough, N. H.	904,888	Richmond, Ga.	188,492
Spartanburg, S. C.	839,010	Laurens, S. C.	185,736
Windham, Conn.	770,005	York, S. C.	184,401
Worcester, Mass.	769,020	Rockingham, N. C.	172,918
Greenville, S. C.	748,178	Durham, N. C.	172,532
Hampden, Mass.	654,276	Chambers, Ala.	169,000
Essex, Mass.	639,772	Newberry, S. C.	167,272
Kent, R. I.	590,300	Kennebec, Me.	160,731
Anderson, S. C.	579,691	Hampshire, Mass.	158,576
Gaston, N. C.	574,592	Cherokee, S. C.	155,188
New London, Conn.	511,977	Lancaster, S. C.	149,848
Berkshire, Mass.	492,241	Alamance, N. C.	148,916
Androscoggin, Me.	410,555	Knox, Tenn.	148,792
York, Me.	408,600	Calhoun, Ala.	138,148
Oneida, N. Y.	404,824	Rutherford, N. C.	137,060
Pittsylvania, Va.	381,423	Troup, Ga.	131,090
Stratford, N. H.	328,140	Richmond, N. C.	130,598
Union, S. C.	319,656	Cumberland, Me.	124,392
Cabarrus, N. C.	304,943	Spalding, Ga.	120,452
Muscogee, Ga.	287,852	Floyd, Ga.	120,272
Mecklenburg, N. C.	269,602	Stanley, N. C.	118,296
Richland, S. C.	245,452	Philadelphia, Pa.	116,796
Gulford, N. C.	236,766	Palladega, Ala.	114,680
Essex, N. J.	232,291	Merrimack, N. H.	111,636
Albany, N. Y.	227,344	Baltimore City, Md.	108,008
Madison, Ala.	221,390	Ballston N. C.	103,880
Greenwood, S. C.	215,184	Chester, S. C.	103,824
Bristol, R. I.	214,216	Hall, Ga.	101,956

In the 62 counties in the United States which had more than 100,000 cotton spindles each, the total number of such spindles was 27,200,028, or 81.6 per cent of the aggregate for the country. Of these counties 3, with a total of 9,938,710 spindles, or 29.8 per cent of the aggregate for the United States, had more than 1,000,000 spindles each; 11, with 7,563,115, or 22.7 per cent of the aggregate, 500,000 but less than 1,000,000 each; 18, with 5,364,036, or 16.1 per cent of the aggregate, 200,000 but less than 500,000 each; and 30, with 4,334,167, or 13 per cent of the aggregate, 100,000 but less than 200,000 each. Of the 62 counties, 14 are in South Carolina, 11 in North Carolina, 7 each in Georgia and Massachusetts, 4 each in Alabama and Maine, 3 each in New Hampshire and Rhode Island, 2 each in Connecticut and New York, and 1 each in Maryland, New Jersey, Pennsylvania, Tennessee, and Virginia.

Bristol County, Massachusetts, with 7,197,375 cotton spindles, led all other counties, having 64.8 per cent of the total spindle capacity for Massachusetts, 40.5 per cent of the total for New England, and 21.6 per cent of the total for the United States. The industry was established in this county at an early date, and it has long maintained a leading position. Fall River, the most important city in the United States from a cotton manufacturing standpoint, is located in this county, as well as the cities of New Bedford and Taunton, and a number of towns engaged largely in the manufacture of cotton. Providence county, Rhode Island, with 1,665,427 cotton spindles, held second place, and Middlesex County, Massachusetts, with



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1,075,908 cotton spindles, third. In the Southern states, Anderson, Greenville, and Spartanburg counties, in the western part of South Carolina, and Gaston county, in North Carolina, are the only ones with more than 500,000 cotton spindles each, Spartanburg County having the largest number, 830,016. In Virginia, Pittsylvania County, with 331,424 spindles, ranked first; in Georgia, Muscogee County, with 297,852; in Alabama, Madison County, with 221,390; and in Tennessee, Knox County, with 148,792.

The relative standing of any county in the cotton

manufacturing industry as a whole depends largely upon whether the factories are devoted to spinning only, or to both spinning and weaving. In some counties the mills make a specialty of spinning yarn which is used elsewhere, while in others practically all the yarn spun is used in the county, and in still others the operations are largely confined to weaving and otherwise using yarns spun elsewhere.

*Ring and mule spindles.*—Table 19 shows, by states, the number of active ring and mule cotton spindles in the United States in 1904, 1909, 1914, 1915, and 1916.

TABLE 19.—NUMBER OF ACTIVE RING AND MULE COTTON SPINDLES, BY STATES, FOR SPECIFIED YEARS: 1904 TO 1916.

[The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31.]

STATE.	NUMBER OF ACTIVE COTTON SPINDLES.										
	1916			1915		1914		1909 <sup>1</sup>		1904	
	Total.	Ring.	Mule.	Ring.	Mule.	Ring.	Mule.	Ring.	Mule.	Ring.	Mule.
United States.....	32,805,883	29,094,263	3,711,620	28,122,792	3,841,443	28,016,390	4,091,182	23,256,023	4,922,839	18,218,800	5,453,264
Alabama.....	1,111,660	1,105,060	6,600	1,021,436	6,600	1,022,500	6,600	909,587	3,916	765,727	7,000
Connecticut.....	1,343,373	934,999	408,374	902,666	417,260	898,701	418,502	832,830	446,586	715,739	492,070
Georgia.....	2,259,855	2,211,431	48,424	2,101,253	46,880	2,079,010	51,836	1,703,071	71,896	1,254,885	76,672
Illinois.....	56,568	42,168	14,400	42,168	14,400	42,168	14,400	23,240	16,000	16,000	16,000
Indiana.....	86,044	86,044	.....	86,044	.....	86,044	.....	115,152	8,952	104,424	24,868
Kentucky.....	87,944	71,424	16,520	77,308	16,520	82,351	15,408	68,124	16,920	57,572	23,820
Louisiana.....	59,563	57,307	2,256	53,939	2,256	36,508	2,256	63,096	4,806	56,552	5,500
Maine.....	1,090,006	1,012,807	77,199	996,639	82,864	1,026,012	86,704	867,304	161,316	673,698	223,724
Maryland.....	147,009	147,009	.....	142,113	.....	155,968	.....	133,302	.....	136,456	.....
Massachusetts.....	10,896,774	9,109,308	1,787,466	8,757,082	1,877,919	8,893,607	1,985,696	7,480,902	2,156,699	6,177,227	2,412,444
Mississippi.....	128,794	128,794	.....	124,658	.....	137,568	.....	159,104	800	128,852	.....
Missouri.....	31,920	31,480	440	31,896	440	31,480	440	30,304	440	14,101	.....
New Hampshire.....	1,455,282	1,416,974	38,008	1,419,589	37,160	1,395,912	58,232	1,189,850	156,050	1,033,721	270,755
New Jersey.....	479,873	262,210	277,663	192,311	272,692	190,363	279,472	107,381	313,403	87,960	348,804
New York.....	906,911	765,682	141,229	711,440	176,653	739,642	191,263	547,512	415,329	364,304	425,216
North Carolina.....	3,988,098	3,918,392	69,706	3,751,890	71,408	3,702,280	68,036	2,886,453	71,782	1,836,315	80,024
Pennsylvania.....	249,053	143,752	105,301	143,752	101,957	142,440	101,589	139,062	139,245	146,396	134,511
Rhode Island.....	2,552,765	1,870,661	682,794	1,812,568	660,564	1,732,798	779,904	1,496,434	875,343	1,236,564	850,238
South Carolina.....	4,735,193	4,728,433	6,760	4,657,046	26,582	4,580,352	3,360	3,732,063	28,828	2,860,884	15,812
Tennessee.....	139,148	309,148	10,000	306,104	10,000	288,010	10,000	287,530	10,000	153,903	10,000
Texas.....	116,012	116,012	.....	113,052	.....	119,408	.....	97,628	.....	68,170	.....
Vermont.....	135,864	125,664	10,200	126,104	10,200	116,104	10,200	75,872	15,840	80,312	27,716
Virginia.....	506,166	495,996	10,170	494,776	8,668	466,336	7,050	316,970	7,572	194,006	7,084
All other states.....	61,808	61,808	.....	57,380	480	56,840	240	63,192	1,116	55,032	.....

<sup>1</sup> In this table the figures for 1909 relate to the calendar year, whereas in Table 17, they relate to the year ending Aug. 31.

Of the 32,805,883 active cotton spindles in the United States reported for 1916, only 3,711,620, or 11.3 per cent, were mule spindles. This compares with 3,841,443, or 12 per cent, of the total in 1915; 4,091,182, or 12.7 per cent, in 1914; 4,922,839, or 17.5 per cent, in 1909; and 5,453,264, or 23 per cent, in 1904, showing a continuous decrease not only in the actual number, but also, and to a greater degree, in the proportion. The tendency to displace mule spindles with frame shows no diminution, as during the past year a number of establishments have followed this practice. Because of the ease with which ring spindles can be operated, manufacturers use frames rather than mules whenever it is practicable. In fact, new mules are seldom installed, except when very fine filling yarns, soft-twisted knitting yarns, or very coarse yarns made from short-staple cotton or waste are to be spun.

The use of mule spindles is confined largely to the New England states, which reported 80.9 per cent of the total number for the country in 1916, most of the remainder being in New York and New Jersey,

and only 170,876 being returned for the cotton-growing states. Since some yarns requiring special qualities can not be made satisfactorily by the use of ring spindles, there will always be a demand for mule spindles unless difficulties heretofore met with in the use of ring spindles can be overcome.

## COTTON CONSUMED.

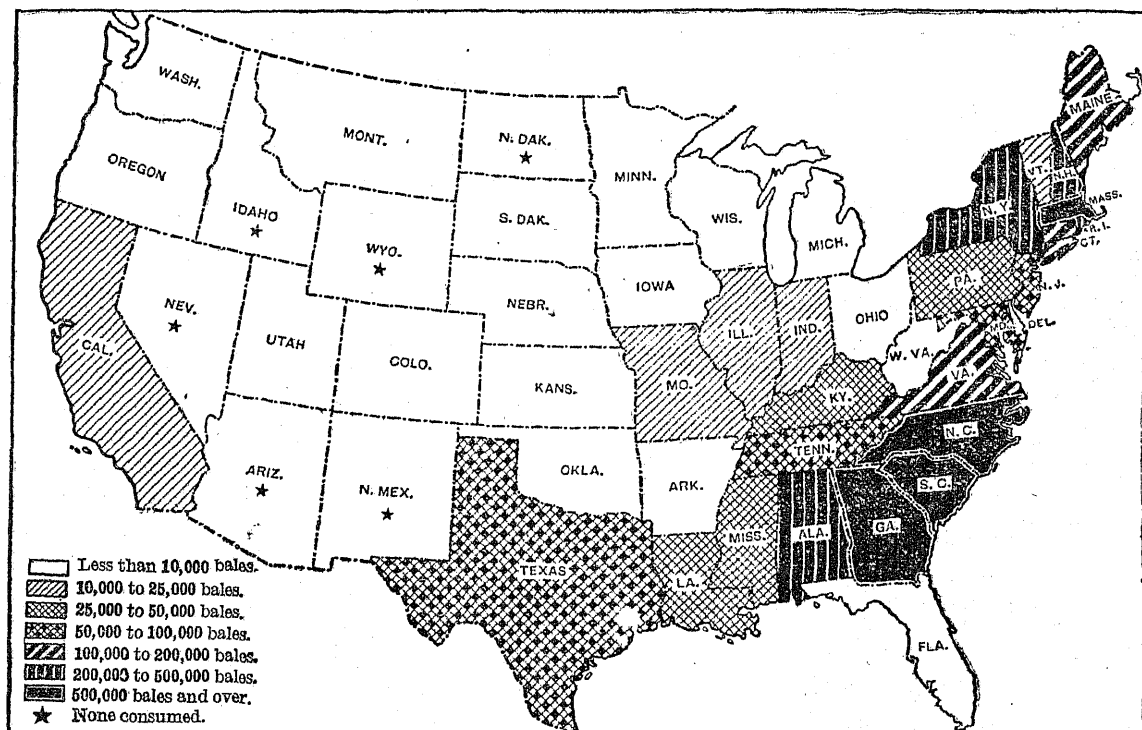
The statistics for cotton consumed, presented in Table 17, cover all establishments which use raw cotton. The figures are expressed in running bales, except that round bales are counted as half bales and that foreign cotton has been reduced to equivalent 500-pound bales. The quantity of cotton consumed in the United States during the year ending July 31, 1916, was 6,397,613 bales, compared with 5,597,362 bales in 1915; 5,577,408 bales in 1914; 5,483,321 bales in 1913; and 5,129,346 bales in 1912. It is the largest amount ever consumed in a single year, being 800,251 bales greater than that in 1915, the next largest.

Massachusetts, with 1,462,888 bales, leads all the other states in the quantity of cotton consumed;

North Carolina, with 1,067,288 bales, is second; South Carolina, with 914,532 bales, third; and Georgia, with 797,789 bales, fourth. The largest actual increase in the annual consumption of cotton shown for the period covered by the table is in the cotton-

growing states. The consumption in North Carolina increased from 819,555 bales to 1,067,288 bales, or 30.2 per cent; in South Carolina, from 726,856 bales to 914,532 bales, or 25.8 per cent; and in Georgia, from 548,565 bales to 797,789 bales, or 45.4 per cent.

MAP 2.—CLASSIFICATION OF STATES ACCORDING TO THE QUANTITY OF COTTON CONSUMED: 1916.



*Kinds of cotton used.*—The statistics as to raw cotton consumed and stocks held in manufacturing establishments for 1914, 1915, and 1916, which are presented in Table 17, are shown only as domestic and foreign cotton. In Table 20 the statistics are further segregated so as to show the consumption of the different kinds and the amount of each kind held in consuming establishments. The table also shows the amount for the group of "Cotton-growing states" and the group of "All other states."

Of the total consumption of cotton in the United States during the year ending July 31, 1916, 5,997,973 bales were upland, 82,645 sea-island, and 316,995 foreign. In the cotton-growing states the consumption was 3,527,528 bales, and, in all other states, 2,870,085 bales, 1916 being the fifth consecutive year in which the consumption in the cotton-growing states has exceeded that in all other states.

Nearly all of the cotton consumed in the United States is domestic upland cotton. The term "upland" is applied to all cotton produced in this country, except sea-island cotton, and includes the long-staple upland varieties, which constitute a larger proportion than formerly. The manufacturers in the cotton-growing states use very little sea-island or foreign cotton, having consumed only 38,712 bales of both kinds combined in 1916. In all other states the consumption of foreign cotton amounted to 301,857 bales,

and of sea-island to 59,071 bales. More than one-half of the sea-island cotton consumed in the United States was reported from Massachusetts and Rhode Island. North Carolina, Connecticut, Georgia, and South Carolina follow in the order of quantity used. Establishments engaged in the manufacture of thread and automobile tires and those which spin yarns designed for these purposes report the largest consumption of this kind of cotton.

A very large proportion of the foreign cotton consumed in the United States is Egyptian. In this country it is used principally for mercerizing and for other processes that give a high finish to cloth; in the manufacture, without dyeing, of Balbriggan underwear and lace curtains in which the ecru shade is desired; for automobile tires; and in the manufacture of sewing thread and other similar articles which require a long fiber of great strength and for which no other type of cotton except sea-island has yet proved suitable. Egyptian cotton is said to be freer from trash and short fibers than American cotton, and, for this reason, to yield less waste in combing and carding. Rough Peruvian cotton is used, to some extent, for mixing with wool in the making of woolen textiles, while Chinese and Indian cotton are used, to a very limited, but growing, extent, for mixing with the American upland cotton in the manufacture of the cheaper grades of goods.

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TABLE 20.—QUANTITY OF THE SEVERAL KINDS OF RAW COTTON CONSUMED AND OF STOCKS HELD IN CONSUMING ESTABLISHMENTS: 1914, 1915, AND 1916.

[Quantities are given in running bales, except that round bales are counted as half bales and foreign cotton in equivalent 500-pound bales. Linters are not included. The statistics for 1915 and 1916 relate to the 12 months ending July 31 and those for prior years to the 12 months ending Aug. 31.]

KIND AND LOCALITY.	RAW COTTON CONSUMED DURING YEAR (BALES).			STOCKS HELD IN CONSUMING ESTABLISHMENTS AT END OF YEAR (BALES).		
	1916	1915	1914	1916	1915	1914
United States..	6,397,613	5,507,362	5,577,408	1,632,245	1,401,185	675,873
Domestic:						
Upland.....	5,997,973	5,295,911	5,301,420	1,462,273	1,287,484	593,294
Sea-island.....	82,645	79,394	81,673	27,454	24,919	18,430
Foreign:						
Egyptian.....	269,324	181,211	151,091	123,406	96,828	51,787
Peruvian.....	10,886	10,529	13,003	1,809	1,739	1,609
Chinese.....	32,347	26,501	25,411	16,147	8,903	9,420
Other.....	4,438	3,816	4,804	1,156	1,312	1,333
Cotton-growing states.....	3,527,528	3,026,960	2,925,294	684,654	577,201	195,490
Domestic:						
Upland.....	3,488,816	2,996,180	2,898,015	667,787	567,304	189,809
Sea-island.....	23,574	17,133	14,966	5,093	3,658	2,003
Foreign:						
Egyptian.....	9,394	7,794	6,921	9,749	4,463	2,048
Peruvian.....	1	153	74	-----	-----	100
Chinese.....	5,618	5,648	4,646	2,025	1,710	1,470
Other.....	125	61	672	-----	6	-----
All other states.....	2,870,085	2,570,393	2,652,114	947,591	823,984	480,383
Domestic:						
Upland.....	2,509,157	2,299,731	2,403,411	794,486	700,120	403,425
Sea-island.....	59,071	62,261	66,707	22,361	21,261	16,427
Foreign:						
Egyptian.....	259,930	173,417	144,170	113,657	92,365	49,739
Peruvian.....	10,885	10,376	12,929	1,809	1,739	1,509
Chinese.....	26,729	20,853	20,765	14,122	7,193	7,950
Other.....	4,313	3,755	4,132	1,156	1,306	1,333

LINTERS CONSUMED.

"Linters," the short fiber obtained by the cottonseed-oil mills from reginning cottonseed before extracting the oil, enters into many lines of manufacture in which otherwise it would be necessary to use cotton. It is used in upholstering and in the manufacture of mattresses, comforts, batting, cushions, wadding, and pads; for mixing with shoddy and for making low-grade yarns, wrapping twine, cheap rope, and lamp and candle wicks; for making absorbent cotton; and in the manufacture of guncotton, niter powder, and writing paper. In the United States the greatest quantity, prior to the European war, was consumed in the manufacture of felts and batting. The demand for explosives within the last two years has resulted in greatly increasing the quantity of linters used in the manufacture of guncotton and smokeless powder. According to Table 17 the quantity of linters consumed in 1916 was 880,916 bales, as compared with 411,845 bales in 1915, 307,325 bales in 1914, 303,009 bales in 1913, and 238,237 bales in 1912.

The introduction of smokeless powders created a new use for cotton which, at the present time, requires a considerable quantity of this fiber. Guncotton, technically known as nitrocellulose, obtained by the nitration of cellulose, forms the principal ingredient of these powders. The purest form of natural cellulose is cotton, and this fiber is used almost exclusively in the manufacture of guncotton. Experiments have

proved that the short-fiber cottons are better suited for this purpose than are the longer; hence linters are being very generally used. This extended demand for linters has very materially increased the price of this product, the market price being several times as high as it was before the war.

Before cotton and linters can be used in the manufacture of explosives it is necessary that they be thoroughly cleaned and purified. In some instances the manufacturers of explosives have installed machinery for this purpose, but, in many cases, this work is done by others. Monthly reports of cotton and linters consumed are obtained only from establishments using the raw material hence establishments which do not handle raw cotton, but purchase their supplies in a partially manufactured condition are not required to report such cotton. This method avoids duplication in reporting the same cotton by two establishments.

The act of Congress approved August 7, 1916, provides for the collection of the quantity of raw and prepared cotton and linters, cotton waste, and hull fiber consumed in the manufacture of guncotton and explosives of all kinds and of absorbent and medicated cotton for the calendar year 1915 and quarterly thereafter. The statistics collected in conformity with this law will permit of the compilation of accurate data showing the quantity of cotton fiber used in the United States in the manufacture of explosives.

The processes through which cotton passes in its preparation for use in the manufacture of guncotton are described in the following statement which was prepared by the War Department:

The cotton used in explosives manufacture consists of unspun short fibers, generally the linters and hull fibers which remain after the earlier ginning has removed the longer fibers more valuable for spinning and less suited to the manufacture of explosives. As an example of the treatment of this material, the United States Army specifications for smokeless powder require that the cotton be purified and bleached and thoroughly washed to remove the purifying and bleaching materials, salts, etc., and that, as the result, the cotton shall contain not more than 0.4 per cent of extractive matter, not more than 0.8 per cent of ash, and not more than "traces" of lime, chlorides, sulphates, etc., also that it be of uniform character, clean, and free from such lumps as would prevent uniform nitration. It is delivered to the explosives factory in bales, sometimes compressed, sometimes not, but always covered with paper or other material for protection from dirt.

In making smokeless powder or explosives, the cotton generally after being run through a picking machine to separate the fibers, is dipped in nitric and sulphuric acids to nitrate it, producing nitrocellulose, which is then washed, boiled, cut in a beater or pulping machine, further washed and then wrung in a centrifugal. Up to this point the only important difference depending upon use is the degree of nitration, being more highly nitrated if for use as a high explosive. Such nitrocellulose, generally called military guncotton, is usually after the foregoing operations completed by pressing into blocks. If for smokeless powder the nitrocellulose must, however, be thoroughly dehydrated, mixed with a suitable solvent, and worked to a very stiff paste or colloid, either alone or mixed with other ingredients (nitroglycerin, etc.), and is then forced from a hydraulic press through dies and cut into grains of desired length, and dried.

GROWTH OF THE COTTON INDUSTRY SINCE 1840.

Table 21 shows the production and consumption of cotton and linters in the United States and the number of active cotton spindles for specified years from 1840 to 1916.

These statistics of consumption and active spindles are a measure of the growth of cotton manufacturing. Since 1890 the number of spindles in the United States has more than doubled, while the quantity of cotton and linters consumed in 1916 was the largest returned for a single year, being 7,278,529 bales, or nearly three times that for 1890.

The most significant fact brought out by this table is the rapid growth of the industry in the cotton-growing states. In 1880 there were only 561,360 active cotton spindles in these states, and the quantity of cotton consumed was 188,748 bales. In 1916,

13,382,065 spindles were operated and the quantity of cotton and linters consumed was 3,977,130 bales. Between 1900 and 1916 the consumption in these states increased 161.1 per cent, while in the New England states it increased 37.6 per cent, and in all other states, 53.1 per cent. The consumption in 1900 in the cotton-growing states amounted to 39.3 per cent of the total for the country, compared with 49.3 per cent for the New England states, and 11.4 per cent for all other states. For the year ending July 31, 1916, the consumption in the cotton-growing states formed 54.6 per cent of the total for the country; that in the New England states, 36.1 per cent; and that in all other states, 9.3 per cent. Of the total number of spindles operated during 1916, 40.7 per cent were in the cotton-growing states, 53.3 per cent in the New England states, and 6.0 per cent in all other states.

TABLE 21.—PRODUCTION AND CONSUMPTION OF COTTON AND NUMBER OF ACTIVE COTTON SPINDLES IN THE UNITED STATES, BY SECTIONS, FOR SPECIFIED YEARS: 1840 TO 1916.

[The quantities are given in running bales, except those for production in 1850, 1860, and 1870, which are in equivalent 400-pound bales, and those for consumption from 1840 to 1870, and for foreign cotton, which are in equivalent 500-pound bales. Linters are included.]

YEAR.	Cotton produced (bales). <sup>1</sup>	COTTON CONSUMED (BALES).				ACTIVE COTTON SPINDLES.			
		United States.	Cotton-growing states.	New England states.	All other states.	United States.	Cotton-growing states.	New England states.	All other states.
1916.....	12,012,813	7,278,529	3,977,130	2,627,150	674,249	32,805,883	13,382,065	17,474,264	1,049,554
1915.....	16,738,241	6,009,207	3,198,353	2,107,220	618,634	31,964,235	12,955,712	17,109,615	1,907,903
1914.....	14,613,964	5,884,733	3,023,415	2,251,041	610,277	32,107,572	12,711,303	17,408,372	1,987,897
1913.....	14,090,863	5,786,330	2,960,518	2,210,813	614,999	31,519,766	12,227,226	17,311,451	1,981,089
1912.....	16,109,349	5,367,583	2,712,223	2,108,360	547,000	30,578,528	11,582,869	17,139,945	1,855,714
1911.....	11,965,962	4,704,978	2,328,487	1,911,092	465,399	29,522,597	11,084,623	16,510,981	1,926,993
1910.....	10,886,209	4,798,953	2,292,333	2,016,386	490,234	28,266,862	10,494,112	15,735,086	2,037,604
1909.....	13,432,131	5,240,719	2,553,797	2,144,448	542,474	28,018,302	10,420,200	15,591,851	1,997,254
1908.....	11,325,882	4,539,090	2,187,096	1,894,835	457,159	27,505,422	10,200,903	15,329,333	1,975,186
1907.....	13,765,265	4,984,936	2,410,993	2,073,355	500,588	26,375,191	9,527,964	14,912,517	1,934,710
1906.....	10,725,602	4,909,279	2,373,577	2,059,900	475,802	25,250,096	8,994,868	14,407,580	1,847,648
1905.....	13,697,310	4,278,980	2,140,151	2,173,282	2,385,547	23,687,495	7,631,331	14,202,971	1,853,193
1900.....	9,507,786	3,873,165	1,523,168	1,909,498	440,499	19,472,232	4,367,688	13,171,377	1,933,167
1890.....	7,472,511	2,518,409	1,038,895	1,502,177	477,337	14,384,180	1,570,288	10,934,297	1,879,595
1880.....	5,765,359	1,570,344	188,748	1,129,498	252,098	10,653,435	561,360	8,632,985	1,459,988
1870.....	3,011,996	796,616	68,702	551,250	176,664	7,132,415	327,871	5,498,308	1,306,236
1860.....	5,387,052	845,410	93,553	567,403	184,454	5,235,727	324,052	3,858,962	1,052,712
1850.....	2,469,093	575,506	78,140	430,603	66,763	3,998,022	264,571	2,058,536	774,915
1840.....	2,063,915	286,525	71,000	168,708	6,817	2,284,631	180,927	1,597,394	506,310

<sup>1</sup> Relates to crop of preceding year.

<sup>2</sup> Does not include foreign cotton.

<sup>3</sup> Cotton mills only.

STOCKS OF COTTON.

The quantity of baled cotton held in the United States on July 31, 1916, as shown in Table 1, was 3,139,709 bales, which compares with 3,936,104 bales in 1915 and 1,365,864 bales in 1914. The amount is the largest ever held at the close of a cotton year, with the exception of 1915, when, because of the large crop of 1914 and the demoralization in the cotton market, due to the European war, stocks carried over from the old year were unprecedented. The segregation of stocks shown in this and succeeding tables is based upon the location of the cotton and not upon the

ownership or the locality of growth. For instance, cotton in warehouses connected with the mills is classed as in consuming establishments, while cotton in independent warehouses and other public storage places and at compresses comprises all cotton held in such establishments, regardless of its ownership. Statistics of stocks held in consuming establishments at the end of the cotton years are shown in Table 17, by states, for the years 1912 to 1916. The amounts held on July 31 are shown in Table 22 for the last four years. The quantity for 1916 was 1,632,245 bales, compared with 1,401,185 bales in 1915, 905,762 bales in 1914, and 957,561 bales in 1913.

## COTTON WAREHOUSING FACILITIES.

The cotton crop is largely harvested and ginned from September 1 to November 30 of each year, and a large proportion of it is disposed of by the growers during this period. Such rapid marketing of the crop tends to depress the price, and the producer frequently realizes less than he would if a better system in this regard were inaugurated. Many have advocated a gradual marketing of the crop, and, to this end, there has been, for several years, persistent agitation for adequate warehousing facilities. There has been marked improvement in this direction, but much remains to be done before suitable storage facilities, properly distributed, are provided. To render efficient service, warehouses must be so constructed as to provide protection from fire and secure cheap insurance rates, thus bringing the total expense of storage low enough to enable growers and others generally to make use of them. With proper supervision and safeguards, the warehouse receipts of cotton so stored not only will be easily negotiable, but will provide acceptable collateral for loans. This latter feature would enable the owner to hold his cotton until such time as, in his opinion, it could be sold most advantageously.

The extraordinary conditions existing after the outbreak of the war in 1914 brought the need of proper warehousing accommodations to the notice of all concerned. In order to provide some information regarding the capacity of warehouses for the storage of cotton in the cotton-growing states, the Office of Markets, of the Department of Agriculture, made a survey, the results of which are given in Bulletin 216, published April 26, 1915. The following statement showing the number and estimated storage capacity of all warehouses in the cotton belt taken from this publication and presented in Census Bulletin 131 is reproduced:

ESTIMATED NUMBER AND STORAGE CAPACITY OF WAREHOUSES AND COTTON-MILL WAREHOUSES IN THE COTTON-PRODUCING STATES: SEASON OF 1914-15.

STATE.	Combined storage capacity.	WAREHOUSES.		COTTON MILLS.	
		Number.	Capacity in bales as offered.	Number.	Capacity in flat bales.
Total.....	15,038,175	3,485	13,742,680	823	1,295,495
Alabama.....	1,946,355	581	1,884,355	62	62,000
Arkansas.....	971,800	233	965,800	6	6,000
Florida.....	353,830	51	357,830	1	1,000
Georgia.....	2,105,780	1,089	1,993,280	151	412,500
Louisiana.....	1,101,930	200	1,095,930	6	6,000
Mississippi.....	1,543,810	167	1,525,810	18	18,000
North Carolina.....	665,441	149	264,446	326	400,995
Oklahoma.....	849,330	120	842,330	7	7,000
South Carolina.....	1,063,560	337	1,363,560	164	300,000
Tennessee.....	940,435	31	919,435	27	27,000
Texas.....	2,549,324	497	2,513,324	36	36,000
Virginia.....	335,580	30	310,580	19	19,000

According to the statement, the combined storage capacity of all warehouses is sufficient to house the largest crop, allowing for the natural export movement of cotton during the period of harvesting. However,

many of the warehouses are not constructed along approved lines, and the risk and expense of storing in them is too great to make them of value. Furthermore, the greater number of them—and these comprise practically all of the modernly constructed—are located in the large shipping centers and are not available to growers generally. Included in the statement are warehouses which have not been erected expressly for the storage of cotton, but which are used both for cotton and other products.

The construction and equipment of warehouses determine, in large measure, the insurance rates. For instance, the average insurance rate, as shown in the above-mentioned bulletin for 26 warehouses in Georgia, constructed of wood, was \$3.30 per \$100 per annum; for 69 of corrugated iron, \$2.70; for 215 of brick, \$1.95; and for 5 standard warehouses, \$1.52. In North Carolina the average insurance rate for 11 warehouses constructed of brick was \$1.96 per \$100, and for 5 standard warehouses, \$1.25. The average insurance rate for 30 warehouses in Georgia equipped with sprinklers was \$0.246 per \$100, and for 30 warehouses without sprinklers, \$1.67; for 8 warehouses in North Carolina with sprinklers, \$0.238, and for 8 warehouses without sprinklers, \$1.52.

Bulletin 277, of the Department of Agriculture, published August 7, 1915, outlines, in a general way, some of the essential features of a warehouse for the storage of cotton. It should be of special interest to warehousemen, cotton dealers, and those contemplating the construction of cotton warehouses, and of general interest to all farmers, bankers, and business men of the South.

## MONTHLY REPORTS OF COTTON AND LINTERS CONSUMED AND ON HAND AND ACTIVE COTTON SPINDLES.

Table 22 presents statistics of cotton and linters consumed during each month and on hand in consuming establishments and in public storage and at compresses at the end of each month from September, 1912, to July, 1916, inclusive.

The quantity of cotton consumed, shown in Table 22, varies considerably from month to month. Such variations are naturally to be expected. The consumption of no establishment is uniform from week to week or month to month, because of the exigencies of supply and demand and the shifting of attention from one phase of the business to another. However, these variations in monthly totals are affected somewhat by the number of working days in the months, and prior to August, 1914, by the fact that a number of establishments—among them some of the largest in the country—reported for a four-week or a five-week period, so that the figures for some months covered a five-weeks' consumption of such establishments. This latter condition was called to the attention of the mills, with the result that the reports in nearly all instances now relate to the calendar months.









## COTTON PRODUCTION AND DISTRIBUTION.

*Cotton stocks on specified dates.*—The following table distributes, by states, the cotton on hand in consuming establishments and in public storage and at compresses at the close of each month, during the year ending July 31, 1916. The amounts shown in the table do not include cotton in transit and in private warehouses or cotton in the hands of buyers, merchants, and producers.

TABLE 26.—COTTON ON HAND IN CONSUMING ESTABLISHMENTS AND IN PUBLIC STORAGE AND AT COMPRESSES AT THE CLOSE OF EACH MONTH, BY STATES: AUGUST, 1915, TO JULY, 1916.

[Quantities are given in running bales, except that round bales are counted as half bales and foreign cotton in equivalent 500-pound bales. Linters are not included.]

STATE AND CLASS OF HOLDER.	COTTON ON HAND (BALES).											
	1915					1916						
	Aug. 31.	Sept. 30.	Oct. 31.	Nov. 30.	Dec. 31.	Jan. 31.	Feb. 28.	Mar. 31.	Apr. 30.	May 31.	June 30.	July 31.
In consuming establishments, total.....	1,165,681	1,090,111	1,345,829	1,613,641	1,853,046	1,974,909	1,984,821	1,970,764	2,006,546	1,975,085	1,835,089	1,632,245
In cotton-growing states.....	457,298	500,386	788,775	953,712	1,077,652	1,092,675	1,048,520	1,033,910	1,022,584	969,460	825,950	681,654
In all other states.....	708,383	589,725	557,054	659,929	775,394	882,234	936,292	945,854	983,962	1,005,625	1,009,139	947,591
In public storage and at compresses, total.....	1,712,504	2,805,184	4,170,543	4,981,930	5,195,653	4,534,949	3,970,799	3,407,109	2,814,181	2,143,251	1,520,370	1,107,464
In cotton-growing states.....	1,410,801	2,800,186	3,822,789	4,618,792	4,820,097	4,170,124	3,598,370	3,053,480	2,401,381	1,832,226	1,258,124	878,078
In all other states.....	301,703	304,998	347,754	363,147	374,956	364,825	372,429	353,680	322,800	311,025	262,246	229,386
Alabama:												
In consuming establishments.....	44,839	50,862	73,305	85,823	97,009	98,353	99,281	92,936	90,455	80,284	82,556	70,740
In public storage and at compresses.....	226,869	339,917	493,988	515,957	501,445	437,484	395,162	340,305	284,237	210,958	168,732	137,031
Arkansas:												
In consuming establishments.....	271	143	1,085	1,120	1,547	1,539	1,387	1,335	1,130	990	868	613
In public storage and at compresses.....	25,514	51,255	108,278	233,611	244,483	204,915	165,532	143,364	104,665	59,636	35,620	10,219
California:												
In consuming establishments.....	39,815	33,237	31,721	38,484	53,752	60,936	65,237	66,157	65,862	68,968	60,018	61,539
Georgia:												
In consuming establishments.....	129,543	165,671	226,896	264,626	298,494	305,212	285,936	277,868	274,959	251,856	216,771	178,675
In public storage and at compresses.....	364,437	689,184	927,710	1,027,861	1,030,394	943,302	823,781	692,998	589,355	461,088	312,832	245,615
Louisiana:												
In consuming establishments.....	360	286	239	1,096	807	1,810	1,096	1,440	1,036	2,139	1,151	1,201
In public storage and at compresses.....	127,877	174,612	262,309	347,597	411,144	393,471	356,564	298,159	249,854	204,391	151,305	94,863
Maine:												
In consuming establishments.....	43,922	34,434	28,088	39,939	49,509	56,855	64,197	58,700	59,285	62,611	66,980	62,945
Massachusetts:												
In consuming establishments.....	345,555	290,414	274,836	324,895	378,783	432,485	448,623	453,464	479,408	488,621	494,753	464,925
In public storage and at compresses.....	66,146	48,309	47,315	57,272	59,937	62,479	80,616	77,493	82,070	93,301	93,681	108,457
Mississippi:												
In consuming establishments.....	3,065	2,299	4,591	5,347	5,567	6,692	6,259	6,208	6,782	7,584	5,539	5,528
In public storage and at compresses.....	62,209	167,160	289,794	352,958	364,325	269,961	228,153	194,157	147,797	95,471	54,704	33,818
New Hampshire:												
In consuming establishments.....	86,303	68,994	65,035	76,567	80,649	85,281	100,080	100,828	97,203	99,923	104,678	96,968
New Jersey:												
In consuming establishments.....	19,363	16,501	14,005	10,660	11,736	14,711	15,779	20,625	24,980	32,337	29,058	24,167
New York:												
In consuming establishments.....	59,463	48,449	57,676	67,363	77,210	88,998	89,252	89,658	87,606	80,633	77,666	69,992
In public storage and at compresses.....	199,917	226,301	270,933	264,412	265,681	345,340	225,254	212,014	180,621	162,327	122,885	83,279
North Carolina:												
In consuming establishments.....	128,548	124,859	209,837	273,803	317,611	322,560	322,560	308,861	268,293	301,486	200,595	249,120
In public storage and at compresses.....	76,451	69,009	89,488	128,577	150,107	150,007	146,024	134,005	132,480	134,753	104,124	208,911
Oklahoma:												
In consuming establishments.....	117	100	131	249	246	157	359	309	422	640	371	119
In public storage and at compresses.....	10,265	13,322	71,417	157,768	135,270	110,520	85,215	66,865	38,555	17,300	9,220	5,302
Pennsylvania:												
In consuming establishments.....	8,825	8,486	8,101	11,129	10,905	12,606	12,606	13,032	12,972	14,175	13,770	12,271
In public storage and at compresses.....	16,533	16,354	16,956	18,725	18,838	18,107	16,768	12,597	10,923	10,980	9,166	8,553
Rhode Island:												
In consuming establishments.....	81,416	68,447	58,923	71,394	91,219	106,697	114,632	116,505	126,926	125,242	126,904	126,713
South Carolina:												
In consuming establishments.....	93,335	103,414	193,801	220,928	249,697	247,061	234,115	247,303	238,346	223,259	186,002	152,702
In public storage and at compresses.....	127,610	158,086	244,447	307,518	349,123	311,596	286,629	246,180	210,782	172,533	133,057	96,532
Tennessee:												
In consuming establishments.....	20,046	17,138	23,241	38,943	43,253	42,615	41,019	37,234	35,081	29,781	24,093	19,613
In public storage and at compresses.....	52,783	65,183	187,414	299,223	335,635	291,788	266,132	203,539	164,386	113,928	71,857	45,479
Texas:												
In consuming establishments.....	7,076	9,619	16,408	20,252	21,107	20,932	21,067	21,159	20,305	17,301	13,711	9,586
In public storage and at compresses.....	284,602	721,781	1,039,519	1,183,352	1,135,846	917,714	720,549	612,089	454,941	277,272	128,940	74,855
Virginia:												
In consuming establishments.....	14,718	13,007	22,105	30,501	29,571	32,260	35,296	34,302	35,867	34,361	29,460	23,518
In public storage and at compresses.....	42,000	38,588	61,924	89,150	114,556	108,174	105,329	105,908	93,893	68,437	47,542	28,280
All other states:												
In consuming establishments.....	39,161	33,742	29,755	30,513	33,765	37,149	39,233	42,348	45,052	45,881	43,307	38,549
In public storage and at compresses.....	29,291	33,173	39,051	47,953	58,869	70,091	69,091	67,520	69,022	60,876	46,702	33,526

<sup>1</sup> Warehouse stocks included in "All other states."

# IMPORTS AND EXPORTS OF COTTON.

## IMPORTS.

Practically the entire quantity of cotton consumed in the United States is produced in the country, only small quantities for special purposes being imported. Foreign cotton imported into the United States is frequently reshipped at intermediate points, and, in some instances, is counted as imported from the country of

reshipment. There has been a demand for information regarding the country of origin, and the Bureau of Foreign and Domestic Commerce has accordingly arranged to furnish this information. The following table shows the monthly imports of cotton, by countries of production, from September, 1912, to July, 1916, inclusive:

TABLE 27.—TOTAL IMPORTS OF COTTON, BY COUNTRIES OF PRODUCTION, FOR EACH MONTH FROM SEPTEMBER, 1912, TO JULY, 1916, INCLUSIVE.

MONTH.	Year.	IMPORTS OF FOREIGN COTTON (EQUIVALENT 500-POUND BALES).							MONTH.	Year.	IMPORTS OF FOREIGN COTTON (EQUIVALENT 500-POUND BALES).						
		Total.	Produced in—								Total.	Produced in—					
			Egypt.	China.	Peru.	India.	Mexico.	All other countries.				Egypt.	China.	Peru.	India.	Mexico.	All other countries.
August.....	1915	18,990	13,176	917	334	1,851	2,368	344	February.....	1916	72,913	64,309	4,596	676	3,080	252	
	1914	27,087	4,329	1,986	559	1,151	19,062	1915		28,727	18,097	1,497	971	773	6,771	18	
	1913	7,785	5,553	832	557	814	29	1914		20,771	11,362	3,602	1,426	951	3,361	69	
September.....	1915	26,197	16,505	5,074	9	1,202	2,581	766	1913	34,039	29,899	2,457	1,367	316	.....		
	1914	15,315	8,912	1,201	516	211	4,405	70	March.....	1916	60,005	55,783	203	581	3,004	344	
	1913	7,449	4,000	413	1,328	719	983	6		1915	38,534	31,551	2,426	1,264	158	3,135	.....
1912	8,930	7,710	106	630	433	21	30	1914		30,863	17,096	5,108	886	70	7,556	147	
October.....	1915	13,506	6,757	1,718	617	368	3,893	153	1913	27,889	23,028	1,051	940	2,505	97	262	
	1914	12,150	6,464	1,031	302	353	3,345	155	April.....	1910	67,478	55,245	8,737	897	1,986	613	
	1913	5,599	2,119	751	1,419	266	1,014	.....		1915	54,479	46,285	1,932	1,078	339	4,845	.....
1912	10,571	6,522	3,042	507	345	58	37	1914		32,917	26,860	1,588	791	1,177	2,346	155	
November.....	1915	21,168	15,858	243	643	135	4,233	56	1913	20,776	16,377	3,082	797	.....	520		
	1914	13,454	7,360	1,336	951	.....	3,689	91	May.....	1916	32,602	25,448	5,701	24	76	1,044	309
	1913	7,281	2,404	282	1,523	157	2,898	17		1915	46,173	28,309	4,189	1,000	532	12,065	58
1912	9,452	7,905	471	867	151	3	55	1914		40,114	20,716	2,161	1,039	1,543	14,506	149	
December.....	1915	43,724	37,602	650	719	.....	4,511	242	1913	13,820	11,764	518	461	1	.....	1,076	
	1914	32,293	25,526	731	765	130	5,120	21	June.....	1916	15,803	0,079	3,495	1,443	.....	255	1,531
	1913	15,815	11,888	67	1,324	655	1,635	246		1915	39,178	20,154	4,235	1,314	2,641	10,728	106
1912	24,846	21,548	1,730	1,481	.....	72	15	1914		49,010	11,938	2,122	1,010	477	33,440	23	
January.....	1915	57,552	47,914	2,207	3,745	.....	3,143	543	1913	8,019	6,622	617	572	.....	208		
	1914	39,220	30,951	2,150	1,415	.....	4,713	.....	July.....	1916	7,636	3,120	2,161	1,221	522	612	
	1913	19,024	11,341	508	882	155	6,708	30		1915	35,067	23,835	2,917	188	1,557	6,785	385
1912	52,022	47,098	3,132	1,586	44	160	2	1914		23,790	13,302	3,333	442	865	5,809	34	
									1913	9,496	7,049	1,303	906	80	.....	158	

The total quantity of cotton imported into the United States during the year ending July 31, 1916, amounted to 437,572 equivalent bales of 500 pounds each. During the year 16,577 bales of foreign cotton were reexported, making the net imports 420,995 bales.

Nearly all of the imported cotton consumed in this country is Egyptian, which is used largely for mercerizing and in the manufacture of thread, knit goods, and lace, and automobile tires. During the past year 30,098 bales of Mexican cotton were imported. As this cotton has practically the same characteristics as American cotton, much of it lost its Mexican identity and was included in the reports of consumption and of exports as domestic cotton. At a number of border points, Mexican seed cotton is brought into the United States for ginning. The quantity of this cotton aggregated more than 20,000 bales during the season of 1915-16, nearly all of it being produced in the Imperial Valley in Lower California.

The importation of Chinese cotton during the year amounted to 35,792 bales. This cotton is distinctly of a lower grade than the average American and is used,

to some extent, for mixing with the higher-priced domestic cotton. During the year 10,909 bales of Peruvian cotton were imported. This was almost entirely "rough Peruvian," which is found very desirable for mixing with wool in the manufacture of woolen goods. Smaller amounts of cotton were also imported from a number of other countries, among which are Santo Domingo and Haiti.

## EXPORTS.

Table 28 shows the yearly exports of domestic raw cotton and linters, by customs districts, for the past five years.

The exports of domestic raw cotton and linters from the United States for the year ending July 31, 1916, amounted to 6,191,110 bales. Galveston, with a total of 1,962,824, ranked first among the customs districts in 1916, followed by New Orleans, with 1,251,924 bales; New York, with 738,558 bales; and Georgia, with 568,741 bales. The combined exports for the first two districts named amounted to 3,214,748 bales and represented 51.9 per cent of the total for the country.

COTTON PRODUCTION AND DISTRIBUTION.

TABLE 28.—EXPORTS OF DOMESTIC RAW COTTON AND LINTERS FROM THE UNITED STATES, BY CUSTOMS DISTRICTS: 1912 TO 1916.

[Compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce. The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31.]

CUSTOMS DISTRICT.	EXPORTS OF DOMESTIC COTTON AND LINTERS (RUNNING BALES).					CUSTOMS DISTRICT.	EXPORTS OF DOMESTIC COTTON AND LINTERS (RUNNING BALES).							
	1916	1915	1914	1913	1912		1916	1915	1914	1913	1912			
Total.....	6, 191, 110	5, 544, 563	5, 914, 839	5, 800, 966	10, 681, 758	Eagle Pass.....								
Maine and New Hampshire.....	10, 807	6, 398	2, 643	7, 950	12, 280	El Paso.....								
Massachusetts.....	100, 755	111, 170	94, 454	159, 589	186, 779	Arizona.....				298		325		700
New York.....	738, 558	482, 195	359, 421	615, 418	655, 078	San Francisco.....	192, 462	194, 020	179, 255	262, 917		211, 778		
Philadelphia.....	26, 219	34, 906	58, 906	62, 264	90, 482	Oregon.....						3, 716		
Maryland.....	167, 978	61, 066	173, 167	84, 512	130, 466	Washington.....	431, 945	257, 363	76, 198	104, 506		213, 825		
Virginia.....	82, 123	74, 549	136, 363	73, 070	21, 666	Dakota.....	3, 910	2, 382	533	520		4		
North Carolina.....	170, 557	203, 294	353, 273	317, 831	502, 426	Minnesota.....						908		753
South Carolina.....	85, 128	260, 810	305, 338	228, 282	249, 864	Duluth and Superior.....		40	104			50		
Georgia.....	568, 741	1, 469, 456	1, 513, 039	1, 048, 006	2, 158, 827	Chicago.....	879							
Florida.....	63, 107	81, 739	184, 124	125, 099	215, 424	Michigan.....	101, 926	98, 698	100, 333	91, 021		122, 472		
Mobile.....	81, 513	95, 611	369, 613	143, 147	357, 110	Ohio.....		50				350		
New Orleans.....	1, 251, 924	1, 545, 415	1, 705, 559	1, 350, 336	1, 600, 627	Buffalo.....	9, 305	9, 002	11, 879	8, 049		5, 462		
Subine.....	48, 337	51, 729	32, 808	138, 642	199, 887	St. Lawrence.....	15, 164	11, 640	7, 190	8, 037		16, 024		
Galveston.....	1, 962, 824	3, 433, 241	3, 214, 567	3, 884, 735	3, 700, 237	Vermont.....	49, 334	54, 624	19, 755	22, 062		23, 324		
Laredo.....	23, 695	618	35, 728	59, 713	4, 782	Porto Rico.....		27	273	61		131		
						Hawaii.....		9	11	18				
						Southern California.....	1, 855	4, 500						

Net receipts of cotton, by ports.—The term "net receipts of cotton," as here employed, means the amount of domestic cotton received which has not been transhipped from some other port and already included in the latter's receipts. These statistics must not be confused with those of exports. They include large

quantities of cotton carried in the coastwise trade to New England and other northern states and consumed in this country, as well as cotton carried to other ports and then exported. The statistics of such net receipts for the principal cotton-handling ports are presented in Table 29.

TABLE 29.—NET RECEIPTS OF RAW COTTON AT PRINCIPAL COTTON PORTS, FOR SPECIFIED YEARS: 1875 TO 1916. [Compiled from reports of New Orleans Cotton Exchange. The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31.]

PORT.	NET RECEIPTS OF COTTON (RUNNING BALES).													
	1916	1915	1914	1913	1912	1911	1910	1905	1900	1895	1890	1885	1880	1875
Galveston.....	2, 424, 667	4, 001, 710	3, 365, 460	4, 035, 114	3, 727, 958	2, 948, 354	2, 501, 412	2, 879, 336	1, 710, 263	1, 659, 999	860, 112	463, 463	480, 352	354, 927
Port Arthur and Texas City.....	358, 150	560, 103	513, 439	805, 313	786, 355	527, 989	163, 778	(1)	(1)	(1)	(1)	(1)	(1)	(1)
New Orleans.....	1, 414, 215	1, 810, 184	1, 890, 758	1, 436, 959	1, 662, 098	1, 608, 208	1, 315, 328	2, 689, 520	1, 867, 153	2, 584, 115	1, 973, 571	1, 529, 592	1, 504, 654	993, 481
Mobile.....	163, 365	166, 997	431, 918	230, 699	384, 239	250, 921	255, 065	329, 556	340, 646	253, 187	261, 057	237, 071	358, 971	320, 822
Pensacola.....	70, 737	87, 236	165, 806	125, 633	216, 114	125, 343	138, 234	195, 151	(2)	(1)	(1)	(1)	(1)	(1)
Brunswick.....	141, 229	215, 504	285, 173	240, 500	425, 462	218, 946	227, 301	199, 193	94, 278	(1)	(1)	(1)	(1)	(1)
Savannah.....	1, 042, 840	1, 762, 418	1, 822, 370	1, 306, 264	2, 386, 302	1, 462, 152	1, 365, 825	1, 877, 343	1, 088, 807	944, 410	956, 517	728, 087	741, 018	606, 727
Charleston.....	264, 877	405, 504	423, 920	310, 293	416, 013	286, 528	228, 728	225, 366	265, 523	425, 487	327, 079	507, 802	464, 332	412, 931
Wilmington.....	221, 180	279, 097	390, 023	342, 953	548, 122	410, 182	312, 511	375, 383	282, 360	234, 621	134, 916	94, 054	78, 876	76, 601
Norfolk and Newport News.....	780, 958	829, 683	744, 419	722, 803	862, 217	593, 681	587, 363	841, 174	432, 727	472, 540	404, 056	545, 418	590, 032	387, 279
Baltimore.....	75, 234	83, 114	103, 810	84, 661	125, 393	119, 104	85, 526	72, 427	101, 648	(1)	(1)	(1)	(1)	(1)
Philadelphia.....	8, 266	11, 134	5, 491	8, 326	3, 972	515	2, 581	13, 045	36, 238	(1)	(1)	(1)	(1)	(1)
New York.....	34, 375	30, 022	6, 732	15, 326	6, 961	14, 790	40, 706	33, 798	119, 215	187, 794	176, 502	99, 200	229, 426	179, 163
Boston.....	89, 281	88, 043	21, 578	46, 222	63, 112	39, 093								
San Francisco.....	191, 311	189, 561	177, 048	257, 220	194, 995	100, 787	14, 792	83, 644	118, 891	(1)	(1)	(1)	(1)	(1)
Seattle and Tacoma.....	444, 307	277, 269	78, 271	107, 015	214, 219	57, 120								

<sup>1</sup> Not shown separately.

<sup>2</sup> Includes receipts of Pensacola.

<sup>3</sup> Included in receipts of Mobile.

<sup>4</sup> Not available for years prior to 1911.

The three most important cotton ports, in the order of their importance, are Galveston, New Orleans, and Savannah, and their net receipts during the year ending July 31, 1916, amounted to 4,881,722 bales, or 44.1 per cent of the total quantity of cotton produced in the country from the crop of 1915. The relatively large net receipts at Galveston in recent years are due largely to the increase in cotton production in Texas and Oklahoma and, to some extent, to increased transportation facilities.

Exports of cotton, by countries to which exported.—The annual exports of domestic raw cotton from 1821 to 1916, by countries, and the total value of these exports are shown in Table 30. The quantities cover the fiscal year, while those in Table 28 relate to the cotton year.

Table 30 shows the development of the export trade in raw cotton to the several countries. The total quantity exported during the year ending June 30, 1916, amounted to 6,168,140 bales of 500 pounds each, valued at \$374,186,247. Of this cotton, 2,760,890 bales, or 44.8 per cent, were exported to the United Kingdom, 836,915 bales to Italy, and 890,376 bales to France. No cotton was exported to Germany, which during the fiscal year 1914 took 2,884,324 bales, or 30.3 per cent of the total for that year. This marked change was due to the European war, which also affected the exports to other countries, Italy, Spain, Netherlands, and other European countries all showing large gains when compared with antewar conditions.



## COTTON PRODUCTION AND DISTRIBUTION.

The marked variations from year to year in the quantities of cotton exported to Japan may be attributed, in part, to irregularity in the supply of Indian cotton, upon which the Japanese mills chiefly rely for their raw material. The exports to "All other countries" include cotton to India and to China, in which countries American cotton is used, to some extent, for mixing with the short-fiber native cotton

and in the manufacture of goods requiring a long-staple cotton.

*Exports of domestic cotton, by months.*—In Table 31 the exports of domestic cotton and linters are presented by months and by the more important countries of destination from September, 1912, to July, 1916, inclusive. The total quantity of linters included in each month's exports, since September, 1913, is also shown.

TABLE 31.—EXPORTS OF DOMESTIC COTTON AND LINTERS, BY COUNTRIES TO WHICH EXPORTED, BY MONTHS: SEPTEMBER, 1912, TO JULY, 1916, INCLUSIVE.

MONTH.	Year.	EXPORTS OF DOMESTIC COTTON AND LINTERS (RUNNING BALES) TO—					Linters included in exports.	
		Total.	United Kingdom.	Germany.	France.	Italy.		All other countries.
August.....	1915	162,059	33,748		9,529	48,025	70,757	11,736
	1914	21,210	6,370	52	5	1,546	13,237	885
September.....	1913	257,172	77,488	72,928	52,933	13,568	40,255	(1)
	1915	501,585	230,497		92,217	121,043	57,828	10,624
October.....	1914	125,778	50,980			16,878	58,120	1,808
	1913	930,328	376,425	290,805	131,950	45,290	85,857	3,062
November.....	1912	729,859	293,290	163,449	103,060	36,901	81,159	(1)
	1915	675,279	291,740		106,725	139,541	137,273	12,480
December.....	1914	497,132	232,065		22,302	48,147	194,618	4,104
	1913	1,517,891	514,105	465,525	279,469	54,282	204,510	9,457
January.....	1912	1,515,746	638,780	430,744	239,515	63,606	143,101	(1)
	1915	524,392	159,099		105,940	96,097	163,256	12,725
February.....	1914	760,929	333,700	1,000	42,290	117,898	266,541	7,267
	1913	1,501,259	530,355	516,853	183,494	67,994	202,563	27,005
March.....	1912	1,734,687	764,923	464,058	263,582	51,756	190,363	(1)
	1915	558,278	276,697		78,646	67,813	135,122	11,029
April.....	1914	1,202,115	572,396	47,076	75,630	200,028	307,585	30,431
	1913	1,230,830	473,028	326,938	146,074	80,621	204,169	21,240
May.....	1912	1,391,394	610,386	384,345	166,573	57,056	174,034	(1)
	1916	539,415	339,538		25,348	34,800	139,729	5,408
June.....	1915	1,372,183	585,534	99,913	70,901	217,982	397,853	24,012
	1914	1,052,272	437,231	308,116	78,574	54,824	173,527	24,697
July.....	1913	900,931	355,837	240,037	97,818	49,871	157,318	(1)
	1916	703,932	425,128		89,520	17,544	171,740	15,297
August.....	1915	1,501,701	633,574	88,508	135,833	157,123	480,663	32,242
	1914	751,013	328,794	212,599	74,785	36,473	98,362	39,325
September.....	1913	530,911	166,726	159,817	26,991	47,450	129,927	(1)
	1916	464,035	174,797		99,964	53,047	136,227	37,638
October.....	1915	1,208,573	440,490	6,112	140,311	146,584	475,076	60,175
	1914	695,310	294,999	219,948	70,447	43,130	96,786	39,619
November.....	1913	372,073	97,185	125,019	14,561	44,847	87,461	(1)
	1916	522,375	212,871		91,365	56,056	162,083	34,525
December.....	1915	672,035	378,828		64,650	55,956	172,601	17,609
	1914	395,223	147,208	118,198	25,010	32,568	75,140	32,196
January.....	1913	534,596	208,963	133,024	19,899	38,333	134,372	(1)
	1916	510,081	206,622		71,589	75,000	156,870	37,516
February.....	1915	615,290	359,675		60,158	57,027	138,430	18,708
	1914	394,714	140,618	132,123	29,837	33,323	58,813	29,047
March.....	1913	468,966	164,871	126,574	23,643	41,440	112,438	(1)
	1916	549,926	262,120		63,408	51,670	172,728	51,420
April.....	1915	323,140	119,090		43,941	33,103	122,006	13,065
	1914	255,578	121,726	80,639	11,423	30,349	51,441	23,795
May.....	1913	223,921	88,906	60,804	7,935	27,077	39,199	(1)
	1916	479,753	246,305		87,681	28,269	117,498	54,380
June.....	1915	244,477	58,944		27,209	52,969	105,355	11,569
	1914	126,211	43,777	41,291	2,522	22,758	15,863	8,644
July.....	1913	140,710	39,898	40,548	7,132	24,589	28,543	(1)

<sup>1</sup> Not available.

*Exports of sea-island cotton.*—Statistics of exports of sea-island cotton, by countries to which exported, are given in the following table for the years 1906 to 1916 and for selected years since 1885.

TABLE 32.—EXPORTS OF SEA-ISLAND COTTON, BY COUNTRIES TO WHICH EXPORTED, FOR SPECIFIED YEARS: 1885 TO 1916.

[The statistics for 1915 and 1916 relate to the 12 months ending July 31, and those for prior years to the 12 months ending Aug. 31.]

YEAR.	EXPORTS OF SEA-ISLAND COTTON (EQUIVALENT 500-POUND BALES) TO—					YEAR.	EXPORTS OF SEA-ISLAND COTTON (EQUIVALENT 500-POUND BALES) TO—				
	Total.	United Kingdom.	France.	Germany.	All other countries.		Total.	United Kingdom.	France.	Germany.	All other countries.
1916.....	3,580	1,656			1,924	1908.....	25,587	17,874	7,112	413	188
1915.....	5,824	1,847		516	3,461	1907.....	15,252	11,056	3,925	185	86
1914.....	13,917	8,840	3,248	297	1,532	1906.....	31,624	23,870	6,787	838	129
1913.....	10,003	6,368	3,211	259	165	1905.....	36,240	30,131	5,193	796	120
1912.....	20,192	14,821	4,905	178	288	1895.....	30,455	26,350	3,878	36	191
1911.....	17,797	12,818	4,077	482	420	1890.....	18,568	16,853	1,420	169	126
1910.....	22,748	18,154	4,074	520		1885.....	13,708	11,950	1,560	13	185
1909.....	19,654	13,589	5,070	426	569						









# THE WORLD'S PRODUCTION OF COTTON.

The world's growing demand for cotton has resulted in a material increase in the total production of this well-nigh indispensable fiber. Its cultivation on a commercial scale has been introduced into many widely scattered localities, some of which have only recently taken up its culture, and there are undoubtedly still other localities suited to its cultivation. However, a number of conditions are requisite to the successful production of cotton, the most important factor being a suitable climate. The cotton plant requires a long warm season in which to come to full maturity, as well as adequate moisture. In some localities where the rainfall is insufficient, recourse is had to irrigation. This method of supplying the necessary moisture is used extensively in the cotton-growing districts of Egypt, Russia, Mexico, Peru, Persia, and in some of the districts of India. In order to produce the crop economically it is necessary to have sufficient labor, trained in growing cotton, and, in addition, adequate ginning and transportation facilities. The state of Oklahoma, which formerly lacked all these factors, furnishes an example of their effect. In 1899 the combined production of cotton in Oklahoma and Indian Territories was 215,591 bales, while the crop of 1914 exceeded 1,250,000 bales. The establishment of better transportation facilities in Russian Turkestan has been an important factor in increasing the production in that country.

Many attempts have been made in recent years to extend the cultivation of cotton to new districts, but in most of them one or more of the requisites just mentioned have been lacking. While some of these efforts have demonstrated the possibility of growing very good grades of cotton in a number of new fields, they have not been sufficiently encouraging to warrant the hope of any considerable addition to the world's production of cotton from these sources within the next few years. It seems, therefore, that the demand for cotton must be met, for a time at least, by those countries in which the cultivation is already firmly established.

The European war seriously affected the cotton industry. It made difficult and expensive the transportation of cotton, disturbed the usual channels of trade, lessened the quantity consumed, and left a large surplus to be carried over at the end of the season 1914-15. The prices obtained by the growers were so low as to cause a reduction in the acreage devoted to this staple in all of the leading cotton-producing countries and to discourage its culture in those countries just entering this field of enterprise. The large consumption of cotton during the past season in the United States and several other countries materially

reduced the surplus, thus advancing the price and resulting in a largely increased acreage planted in 1916.

The United States is the only country which has provided an adequate statistical service to ascertain the quantity of cotton produced each year. The Governments of India, Egypt, Russia, and several other countries compile and publish estimates of acreage and production from time to time during the season, and these when available are used in arriving at the world's production. For the greater number of countries, however, the information can be secured only by special correspondence, from consular reports, trade publications, and other miscellaneous sources. The statistics given in Table 37 have been compiled from information secured from these various sources. The table shows the production of commercial cotton, by countries, for the crops of 1911 to 1915. The figures for some countries as published in previous bulletins have been revised.

TABLE 37.—WORLD'S PRODUCTION OF COMMERCIAL COTTON, BY COUNTRIES: 1911 TO 1915.

The statistics for the United States were collected by this bureau. Those for other countries have been compiled from a number of sources, among them being: The Cotton Gazette, Liverpool; Mitsui & Co., Osaka; Reinhardt & Co., Alexandria; Commercial Intelligence Department of the Indian Government; Russian Central Cotton Committee; E. T. Craig, Mexico City, Pan American Union; and the United States Consular Reports.]

COUNTRY.	COTTON PRODUCTION (BALES OF 500 POUNDS NET).				
	1915	1914	1913	1912	1911
Total.....	18,650,000	24,836,000	22,198,000	20,976,000	21,269,000
United States.....	10,709,000	15,438,000	13,545,000	13,113,000	15,013,000
India <sup>1</sup> .....	2,695,000	3,807,000	3,692,000	3,328,000	2,270,000
Egypt.....	963,000	1,884,000	1,496,000	1,492,000	1,463,000
China.....	1,800,000	1,750,000	1,200,000	1,074,000	625,000
Russia.....	1,435,000	1,217,000	1,030,000	917,000	989,000
Brazil.....	250,000	440,000	420,000	315,000	275,000
Mexico.....	125,000	125,000	150,000	140,000	130,000
Peru.....	93,000	103,000	110,000	110,000	100,000
Persia.....	130,000	127,000	140,000	137,000	120,000
Turkey.....	100,000	120,000	130,000	115,000	124,000
All other countries..	350,000	325,000	285,000	235,000	210,000

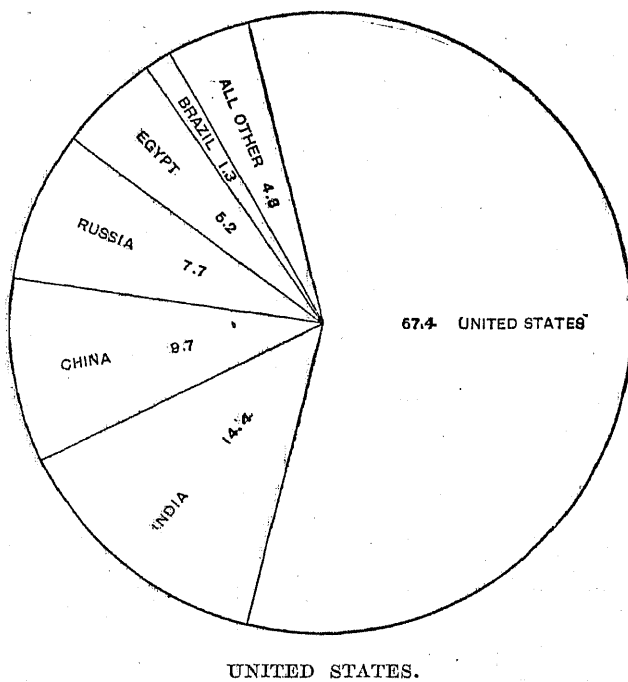
<sup>1</sup> The amounts for India do not include cotton used in home manufacture, although such cotton is included in the reports of cotton produced compiled by the Indian Government.

As the statistics of cotton production for foreign countries are generally expressed in net-weight bales those for the United States in this table have been reduced to that basis. The world's production of cotton in 1915, exclusive of linters, as measured by the factory supply—that is, the quantity destined to enter commercial channels—was 18,650,000 bales of 500 pounds net, as compared with 24,836,000 bales in 1914, 22,198,000 bales in 1913, 20,976,000 bales in 1912, and 21,269,000 bales in 1911. The table shows a great variation in the production of cotton, the total in 1914 being 6,186,000 bales, or 33.2 per cent, greater than in 1915. The average production for mill consumption during the five years covered by the table

was 21,586,000 bales, or 2,936,000 bales greater than the production of 1915. In addition to the amounts shown in the table, considerable quantities of cotton are produced in some countries and consumed in the homes of the people without entering commercial channels. This is the case especially in China and to a less extent in other eastern countries; but the amount of such cotton can not be estimated with any degree of accuracy.

The relative importance of the several cotton-producing countries is graphically presented in the following diagram. Of the total production of commercial cotton in 1915 the United States contributed 57.4 per cent, India 14.4 per cent, Egypt 5.2 per cent, China 9.7 per cent, and Russia 7.7 per cent.

DIAGRAM 1.—PERCENTAGE OF THE WORLD'S MILL SUPPLY OF COTTON CONTRIBUTED BY EACH COUNTRY: 1915.



The greatest cotton-growing section in the world, both in extent and in production, is located in the southern and southeastern parts of the United States. It includes small portions of Virginia, Kentucky, Missouri, Kansas, and New Mexico, and the states lying to the south. The cotton-producing area is about 1,500 miles in width. Within the past few years the cultivation of cotton has been undertaken in Arizona and California, on irrigated land, with considerable success, especially in the latter state. The growing of other valuable crops, however, will likely prevent any considerable increase in the production in these states.

Some idea of the importance of cotton production in the United States from an economic standpoint may be had when it is considered that the comparatively small crop of 1915 was, next to corn, wheat, and hay, the most valuable crop grown in the country. The

value of the cotton crop of 1909 represented 15 per cent of the total value of all the crops of the country. Unmanufactured cotton was the largest single item of export during the fiscal year 1914, the last year unaffected by the war, its value amounting to \$610,475,301, or 26.2 per cent of the total value of all articles of domestic merchandise exported during the year. While cotton lost its high rank among the articles exported, still the large quantity, combined with the 6,398,000 bales consumed in domestic manufacture, strikingly indicate the importance of this staple in the economic affairs of the Nation.

It is, therefore, to be expected that the Federal and state governments would give much attention to this crop. The investigations and experiments have covered every phase of the subject and have aided greatly not only in increasing the production of cotton but in propagating varieties suited to the varying conditions of soil, moisture, insect life, etc., found throughout the cotton belt.

INDIA.

Cotton has been used from time immemorial in India in making cloth for garments. Until in comparatively recent years the fiber was used almost entirely for home consumption, and therefore information as to the quantity produced is not available. The crop of 1790, however, has been estimated at 260,000 equivalent 500-pound bales; that of 1859, at 1,316,800 bales; that of 1865, at 2,090,400 bales; that of 1914, at 4,167,200; and that of 1915 at 3,055,000 bales. Table 38 presents statistics of cotton acreage, production, and yield per acre for India since 1897.

TABLE 38.—COTTON ACREAGE, PRODUCTION, AND YIELD PER ACRE IN INDIA: 1897 TO 1915.

YEAR.	Acreage planted in cotton.	COTTON PRODUCTION.	
		Total (500-pound bales).	Average per acre (lbs.).
1915.....	17,987,000	3,055,000	85
1914.....	24,595,000	4,167,200	85
1913.....	25,020,000	4,052,000	81
1912.....	22,028,000	3,688,000	84
1911.....	21,615,000	2,830,400	59
1910.....	22,590,000	3,082,400	68
1909.....	20,545,000	3,774,400	92
1908.....	19,990,000	2,952,800	73
1907.....	21,630,000	2,407,600	53
1906.....	22,488,000	3,026,400	88
1905.....	20,401,000	3,380,600	88
1904.....	19,918,000	3,080,800	77
1903.....	18,025,000	2,893,714	79
1902.....	16,581,046	3,009,439	90
1901.....	14,506,295	2,648,886	91
1900.....	14,231,150	2,162,918	76
1899.....	14,884,578	1,674,817	70
1898.....	14,602,892	2,512,104	86
1897.....	18,688,487	2,122,968	78

According to the Final General Memorandum on the cotton crop of 1915-16, issued by the Indian Government, the total out-turn is estimated at 3,055,000 bales of 500 pounds each. As a rule, the Government estimates are too low when considered in connection with the figures of cotton exported and of cotton con-

## COTTON PRODUCTION AND DISTRIBUTION.

sumed. While the estimates in some years closely approximate the movement, in other years they are very much below it.

There were 17,967,000 acres planted in cotton in India in 1915, a decrease of 6,628,000 acres compared with 1914. The crop of 1915 amounted to 3,055,000 bales, being 1,112,200 bales less than that of 1914, the record crop for the country. The average yield per acre in 1914 and 1915 was 85 pounds, an amount woefully small when compared with the average production in other countries. This seems all the more strange when consideration is given to the fact that the population of the country as a whole is very dense and that the value of the land for the raising of food-stuffs must be correspondingly great. The average production per acre for the different provinces varies greatly, ranging in 1915 from 56 pounds in Hyderabad and 65 pounds in Madras, to 121 pounds in Sind and to 126 pounds in the United Provinces. Rainfall is depended on very largely for the supply of moisture in growing the cotton crop. The dry seasons in some of the provinces are sometimes extended into periods of drought, which accounts very largely for the low averages in those provinces. In Sind and in some other sections irrigation is resorted to, to some extent, and where this condition is found the average yield per acre is relatively high. Table 39 gives the statistics for the acreage in cotton and the production by provinces, for the crops of 1911 to 1915, inclusive.

The native Indian cotton has a short, coarse fiber, and can not be utilized in the manufacture of the finer counts of yarn. The demand for a better staple for use in some of the Indian mills, as well as for export, has resulted in the Indian Government giving the subject of improving the cotton serious consideration. The principal difficulties to be surmounted are the low yield per acre of these higher grade cottons, the fact that the grower realizes but little more for the better than for the poorer grades, and the mixing of the seed at the ginneries. The Government of India, together with the provincial and local governments, has established seed farms for the purpose of furnishing pure seed to the growers. This plan will ultimately result in materially improving the staple of Indian cotton, and will permit this cotton to enter European markets in competition with American cotton to a much greater extent than heretofore.

Climatic and soil conditions in the several cotton-growing districts in India vary perhaps more than in any other cotton-producing country. In some parts the rainfall is abundant, while in others irrigation is employed to some extent, and in still others is depended upon entirely for moisture. The seasons also vary greatly; for example, in October the cotton crop is being harvested in the north of India, while in the south planting is in progress. As a result cotton is being picked somewhere in the country almost throughout the year.

TABLE 39.—COTTON ACREAGE AND PRODUCTION IN INDIA, BY PROVINCES: 1911 TO 1915.

PROVINCE. (Includes native states within provincial boundaries.)	Year.	Acreage planted in cotton.	Cotton production (500-pound bales).
Total.....	1915	17,967,000	3,055,000
	1914	24,595,000	4,167,200
	1913	25,020,000	4,052,000
	1912	22,028,000	3,688,000
	1911	21,615,000	2,630,400
Bombay.....	1915	4,249,000	714,000
	1914	6,953,000	1,235,200
	1913	6,574,000	1,151,200
	1912	6,064,000	1,059,200
	1911	5,121,000	479,200
Central Provinces and Berar.....	1915	4,061,000	885,000
	1914	4,708,000	877,600
	1913	4,754,000	768,800
	1912	4,493,000	728,000
	1911	4,648,000	730,400
Hyderabad.....	1915	3,220,000	360,000
	1914	3,605,000	320,000
	1913	3,053,000	320,000
	1912	2,888,000	240,000
	1911	3,234,000	240,000
Madras.....	1915	2,188,000	286,000
	1914	2,115,000	196,000
	1913	2,725,000	246,400
	1912	2,414,000	376,800
	1911	2,878,000	268,000
Punjab.....	1915	918,000	156,000
	1914	1,857,000	383,800
	1913	2,053,000	489,600
	1912	1,875,000	298,400
	1911	1,582,000	192,800
United Provinces.....	1915	834,000	210,000
	1914	1,551,000	388,800
	1913	1,586,000	337,200
	1912	1,158,000	342,400
	1911	921,000	200,800
Central India.....	1915	999,000	172,000
	1914	1,519,000	234,400
	1913	1,426,000	218,400
	1912	1,314,000	164,800
	1911	1,400,000	182,400
Baroda.....	1915	566,000	94,000
	1914	843,000	153,200
	1913	749,000	140,000
	1912	762,000	156,800
	1911	665,000	76,800
Rajputana.....	1915	244,000	53,000
	1914	421,000	132,800
	1913	470,000	105,600
	1912	393,000	100,000
	1911	263,000	58,400
Sind.....	1915	169,000	41,000
	1914	336,000	92,800
	1913	341,000	108,000
	1912	296,000	98,400
	1911	316,000	99,200
All other provinces.....	1915	519,000	84,000
	1914	687,000	117,600
	1913	689,000	116,800
	1912	671,000	123,200
	1911	557,000	102,400

The following statement concerning the cotton situation in India appeared in "The Textile Mercury" of Manchester, England, and was reprinted in the July 29, 1916, issue of the "Economic World":

The area under cotton is immense, 25,000,000 acres in 1914, or two-thirds of the whole American area, yet the crop is barely one-third of the American. This very low average yield, only about 80 pounds of lint per acre, is the first point at which improvement could be effected by better methods of cultivation and better seed selection.

It is unnecessary to remind Lancashire that the quality of the bulk of the India crop is very inferior both in staple and condition, but it is not so well known here that this inferiority could be easily removed. That India can grow good cotton of about 1 inch staple and equal to ordinary American in quality is now amply proved by the success of such varieties in practically every Province, but especially in the Punjab, in Sind, in southern Bombay, and in Madras.

Already the amount of such improved cottons in India is somewhere between 300,000 and 500,000 bales per annum, and it could very easily be increased by methods similar to those advocated for the increase of the average yield. And if the average yield and quality, and therefore the money value per acre, of the cotton crop were improved, the area under cotton would almost necessarily be greatly increased, because at present cotton in India has to face the competition of other crops which pay better than the inferior cotton crop, but which would easily be left behind by the value per acre of the improved crop.

Further, the possible cotton acreage is being increased by the opening up of new cotton areas under irrigation—in the Punjab, for example, where the new triple-canal system will add at least 500,000 acres of good cotton land to the already considerable area in that Province. It is no exaggeration, therefore, to say that the Indian cotton crop could be very largely increased and improved in quality, and, what is more, the increase and improvement could be almost immediate. India could produce 1,000,000 bales more every year progressively, which is what the world wants just now, and there is no other area in the world where it can be obtained so quickly.

What is most wanted is just an all-round and synchronized movement toward better methods, and this would pay all parties concerned handsomely. It would pay Lancashire, too, indirectly if not directly, for we must face the fact that we are likely to be short of cotton, and every bale of decent cotton produced anywhere in the world always helps to reduce the pressure of demand on the existing supply.

EGYPT.

The climate and soil of Egypt are unusually well adapted to the production of high-grade varieties of cotton, and the supply of moisture, coming as it does from a usually dependable system of irrigation, can be regulated to the best advantage. The season for gathering, too, is practically ideal, not being marked by storms or rains, and but little unavoidable damage to the matured crop occurs. The length, strength, and color of Egyptian cottons are characteristics of great value, while the uniformity of the fiber, due to the equality of growth, renders them, in manufacturing processes, subject to less waste than are many other kinds. Table 40 shows the cotton acreage, production, and average yield per acre in Egypt since 1895.

TABLE 40.—COTTON ACREAGE, PRODUCTION, AND YIELD PER ACRE IN EGYPT: 1895 TO 1915.

[Compiled from reports of the Egyptian Survey Department.]

YEAR.	Acreage.	PRODUCTION.	
		Total (500-pound bales).	Average per acre (lbs.).
1915.....	1,231,000	963,000	391
1914.....	1,822,000	1,384,000	380
1913.....	1,789,000	1,496,000	418
1912.....	1,787,000	1,492,000	417
1911.....	1,776,000	1,463,000	412
1910.....	1,664,000	1,506,000	453
1909.....	1,619,000	1,600,000	399
1908.....	1,703,000	1,337,000	393
1907.....	1,664,000	1,433,000	431
1906.....	1,564,000	1,277,000	440
1905.....	1,626,000	1,181,000	363
1904.....	1,491,000	1,251,000	420
1903.....	1,383,000	1,280,000	466
1902.....	1,324,000	1,137,000	437
1901.....	1,207,000	1,262,000	487
1900.....	1,277,000	1,077,000	422
1899.....	1,197,000	1,290,000	539
1898.....	1,164,000	1,107,000	476
1897.....	1,172,000	1,206,000	553
1896.....	1,091,000	1,166,000	534
1895.....	1,015,000	1,041,000	513

According to the reports of the Egyptian Government, the acreage devoted to cotton in 1915 was 1,231,000, a decrease of 591,000 acres as compared with 1914. The crop of 1915 is estimated at 963,000 bales of 500 pounds each, this being the smallest crop for any year covered by the table.

The following excerpts from the report on "The Production and Marketing of Egyptian Cotton," by Messrs. J. S. Williams and Clarence Ousley, published as Senate Document 113, Sixty-third Congress, first session, are inserted as an interesting reference concerning the production of cotton in Egypt.

Egyptian-cotton cultivation offers no instruction whatever for America in skill, science, or other element of economy or efficiency, though irrigation there, as elsewhere, demonstrates the more stable and dependable output of the soil with a regular water supply as compared with production dependent upon uncertain and variable rainfall. The rich delta lands of the Nile, it is true, yield more than the average of American land, acre for acre, and the Egyptian cotton, of course, is superior in quality to the short staple which constitutes the greater part of our crop, though our long-staple or sea-island cotton is superior to the Egyptian. At the same time our progressive farmers who fertilize and cultivate intelligently produce about as much short staple per acre as the Egyptians produce, though our long staple is not so prolific as the Egyptian.

Nor can it be said that the Egyptian producers market their crop to better advantage or even to equal advantage, inasmuch as they sell their cotton in the seed and have no accurate idea of the commercial value of the seed or other by-products. On the other hand, they suffer no loss from "country damage," because there is little or no rain during the picking and ginning season, and the cotton is well out of the hands of the producers before the period of light winter rains, which usually fall in January and February. Nor is there excessive waste or toll in sampling. The methods of baling, sampling, and marketing the lint—all effected after it leaves the farmer's hands—may be studied with profit both by way of teaching us to save waste and by way of exhibiting the excessive charges of middlemen.

Egypt's comparatively low cost of production, notwithstanding her antiquated methods of cultivation, her heavy expense of conversion from seed cotton to spinnable lint, is a matter of serious concern to America, for Egypt is able under present conditions to produce her superior quality of cotton, worth now 18 to 20 cents a pound, at about 12½ cents a pound, compared with American cost of 10 to 12 cents a pound, worth now 11 to 12½ cents. We attach a detailed calculation, made to the American consul at Alexandria on May 16 by one of the foremost producers of the country, and confirmed by us in all substantial elements.

*Estimated cost of producing 4 cantars or 400 pounds of cotton in Egypt.*

3 plowings and ridgings.....	\$5.00
Labor:	
Sowing seed and hoeing ridges.....	0.75
Watering (if by gravity).....	0.75
Watering (if lift, cost of turning Dutch wheel).....	1.50
Cost of seed, 55½ pounds.....	1.25
Hoeing, three times.....	3.50
Picking.....	3.40
Worm picking (varies).....	1.00
Manure, 440 pounds superphosphate.....	3.20
Pulling stalks and leveling ridges.....	0.50
Total.....	20.85
Add rent.....	30.00
Grand total.....	50.85

It must be understood that the labor herein reckoned is paid at the rate of 15 to 20 cents a day for adults and 5 to 10 cents for chil-

dren. and the calculation applies to all who are engaged in the work of actually tilling the soil, whether as owners, tenants, or hired workers. Paying the same labor at the cheapest rates paid to unskilled American farm laborers would more than double the expenditure, and the cost of producing Egyptian cotton would far exceed the current market price of the commodity. On the other hand, if modern methods of production were used, the present cost could be reduced 25 to 50 per cent. As the case stands, the average tenant or small owner with three or four children cultivates about 8 acres of land, of which he plants one-third to one-half in cotton, under more or less intelligent rotation, and the remainder in feed and forage crops. The average yield for Egypt during the last few years may be reckoned at 450 pounds to the acre, so we may say in round figures that the cotton output of the average peasant family—all of whom work at cultivating or at tending the animals or otherwise—is about 1,500 pounds, which, at 5 cents a pound profit, will make only \$75 a year for accumulation or for creature comforts, with which the native Egyptian family now has no acquaintance whatever.

All Egyptian cotton is sold in the seed, and substantially all of it leaves the hands of the farmers by the close of the calendar year. The cotton is all bought directly or indirectly by the cotton merchants of Alexandria, who are organized into a compact association.

The gins are located in the villages, not on the farms, and are owned in large part by the cotton merchants of Alexandria. The seed cotton is transported to them by rail, by camels, or by canal boats in sacks furnished by the buyers and used for the baling at the gin and again for the baling at the compresses, or "steam presses," as they are called. The gin presses, or "hydraulic presses," as they are called, pack the cotton into large, clumsy bales of 750 to 850 pounds, which are transported by rail to the compresses, which are likewise owned in greater part by the same cotton merchants of Alexandria. Here the cotton is unwrapped, thrown loose upon the floor, agitated by hand to loosen lumps and expel dirt, sampled, repacked, and wrapped into the Egyptian bale of commerce, which weighs about 750 pounds. One sample is taken for about every 10 bales or for each lot of cotton of uniform variety. At both the gin and the compress effort is made to separate cottons of varying quality and to assemble cottons of the same quality, so that the bales will be of uniform grade. The charge for compressing or steam pressing is \$1.25 for each bale of 750 pounds.

## RUSSIA.

The production of cotton in the Russian Empire is confined almost exclusively to its Asiatic provinces in Turkestan and Transcaucasia. Some experiments have been made in the growing of cotton in the European provinces of Russia which border on the Black Sea, but the total amount produced there is very small. The following table, compiled from the report of Consul General Snodgrass under date of April 10, 1916, gives the estimated production of cotton from the crop of 1915 in Russia, by provinces, with comparative figures for the crop of 1914.

TABLE 41.—COTTON PRODUCTION IN RUSSIA, BY PROVINCES: 1914 AND 1915.

DISTRICT.	500-POUND BALES.	
	1915	1914
Total.....	1,435,164	1,217,254
Turkestan:		
Ferghana.....	687,444	585,178
Syr-Daria.....	133,501	91,681
Samarkand.....	97,215	86,590
Bakskipsky.....	95,216	75,313
Khiva.....	99,110	95,025
Bokhara.....	214,037	175,179
Transcaucasia.....	108,338	108,338

The estimated production of cotton from the crop of 1915 is 1,435,000 bales of 500 pounds each, compared with 1,217,254 bales from the crop of 1914 and 1,030,147 bales from the crop of 1913. Of the total for 1915, Turkestan contributed 1,326,826 bales and Transcaucasia 108,338. Ferghana produced nearly one-half the total for the country, Bokhara and Syr-Daria ranking next in importance.

It may be that the above estimate for 1915 is too low. Commercial Attaché Henry D. Baker, at Petrograd, under date of June 12, stated that the Russo-Asiatic crop (including the crop of the Caucasus but excluding that of Persia) harvested last September and October amounted to 1,516,700 equivalent 500-pound bales. It is probable that this amount includes cotton grown in Afghanistan and Kashgar, but the report is not specific on that point.

The soil and climate of Turkestan are well adapted to the cultivation of cotton. The summers are hot and long and the winters mild. As there is scarcely any rainfall during the growing season, irrigation is necessary. Any extension of the cotton-growing area depends almost entirely upon the construction and extension of irrigation works.

According to Mr. Baker's report there is a greatly increased production of cotton in the districts north of the Oxus River. Large areas of new country are being opened up by irrigation, and the rapid extension of the Bokhara Railway system has brought great additional tracts of cotton-producing country into easy communication with the Russian market. Leading authorities in the cotton trade in Russia estimate that within about 10 years Russia will not need to import any American cotton at all. American seed is being rapidly substituted for native seed, and improved American machinery for ginning, etc., has been extensively introduced.

## CHINA.

Cotton is produced extensively in many sections of China, but no accurate data as to the total amount are available. A considerable amount is consumed locally in the homes of the people, the quantity thus consumed being largely a matter of conjecture. The Ministry of Agriculture of the Republic of China has estimated the annual production of cotton in that country for the crops of 1909, 1910, and 1911 at 4,181,333 bales of 500 pounds each, while the crop of 1912 has been estimated by another authority at 5,333,000 bales. As indicated above, however, these estimates are largely conjectural. It is certain that there has been a tendency, at least in some sections, to increase the production, as the suppression of the trade in opium has made lands formerly devoted to the cultivation of the poppy available for other crops. Another influence tending to increase the production has been the high price of the staple in recent years, and the consequent demand from other countries for this product.

Reliable data as to the quantities of Chinese cotton exported and used in the Chinese spinning mills are available. In addition, large quantities of cotton are consumed in factories engaged in making wadding for clothes and other miscellaneous products, accurate information of the amount so used, however, not being available. An estimate from a reliable source places the quantity of Chinese cotton from the crop of 1915 which will enter commercial channels at 1,800,000 bales of 500 pounds each.

## BRAZIL.

The climate and soil of large areas in Brazil are well suited to the cultivation of cotton. The plant is indigenous to the country, and the aborigines were using the lint of the wild cotton tree for various purposes when the Europeans first visited the country. Nevertheless, the cultivation of the plant received comparatively little attention until the shortage in the supply from the United States during and following the Civil War greatly increased the price of the staple. In 1860 the exports of Brazilian cotton amounted to about 50,000 bales of 500 pounds each, and this figure practically measures that country's commercial production of cotton at that time, as the domestic mill consumption was a negligible quantity. By 1872 the exports had increased to the equivalent of 346,231 such bales, which remains the largest amount ever exported in a single year. A general decrease in the cultivation and exportation of cotton followed, and at the end of 1908 the exports had reached the low mark of 14,256 bales. This figure, however, is not indicative of the production of the country for that year, as the spinning and weaving of cotton in Brazil has developed to such an extent in the past 20 years that it is now the most important manufacturing industry in the country. The mills depend almost entirely upon the home production for their raw material and consume by far the larger portion of the total quantity grown.

In 1912 the exports of Brazilian cotton amounted to 73,960 bales, and in 1913, to 165,008 bales. While exact information as to the production in 1915 is not available, it has been estimated at 250,000 bales. The following statement, taken from the July 29, 1916, issue of "Cotton," indicates that the 1915 crop was a very poor one as regards the yield:

In 1915, owing to the prevalence of a severe drought, supplies of home-grown cotton on which Brazilian cotton manufacturers have hitherto been accustomed to depend, were so much diminished that the Government was petitioned to reduce the duties on foreign-grown cotton. This request was ultimately granted; otherwise the cotton factories would have been closed.

It is, however, not merely due to the exceptional consequences of a bad harvest that the Brazilian Government are prompted to devote their present attention to the question of utilizing to better account the valuable resources the country undoubtedly possesses for cultivating cotton on a large scale; scarcity of shipping and high freights, which have been among the chief results of the

European war, have acted more powerfully than any other incentive in the past to determine the authorities to take measures to promote the vast national wealth of the country.

## MEXICO.

Accurate statistics as to the production of cotton in Mexico from the crop of 1915 are not available. It is generally believed that the normal crop is about 200,000 bales. The unsettled condition of the country during recent years, however, has undoubtedly greatly affected this culture, and the production for last year is placed at only 125,000 bales.

Cotton is cultivated in many parts of Mexico, but the greater portion is grown in the Laguna district, which includes portions of the states of Coahuila, Durango, and Chihuahua, where the production depends almost entirely upon irrigation. The staple produced in Mexico is strong and averages more than an inch in length.

When the factories are operating under normal conditions they consume practically the entire production and draw also upon the United States for a part of their requirements.

## PERU.

The production of cotton in Peru, while comparatively insignificant in quantity, has shown a rapid increase. In 1902 the crop amounted to 36,500 bales of 500 pounds each, and in 1909 to 107,316 bales.<sup>1</sup> Of this amount 95,411 bales were exported and 11,905 bales consumed in Peruvian mills, principally in the manufacture of the coarser cloths. According to a report of Consul General Handley, the crop of 1913 was 110,000 bales and that of 1914, 103,000 bales, while the crop of 1915 was estimated at 93,000 bales.

The principal cotton-producing districts of Peru are located near the coast and are irrigated by waters from the Andes, brought in canals from the many rivers. Rains are almost unknown in these districts, although considerable moisture is supplied in the form of dews, which are unusually heavy. The soil is rich, and the average yield is not far from a bale to the acre.

## OTHER COUNTRIES.

Cotton for mill consumption is also grown in a number of other countries and consideration must be given these in presenting a summary of the world's production. The conditions of soil and climate in some of these countries are so suited to cotton production that the handicaps of insufficient experienced labor and of inadequate transportation facilities will be overcome, and thus will be added to the world's supply of cotton the production of large areas as yet undeveloped. However, because of local conditions, many of them must ever remain of small importance from the standpoint of the quantity of cotton produced.

<sup>1</sup> Cotton Goods in Latin America, by W. A. Graham Clark, special agent of the Department of Commerce.

# WORLD'S CONSUMPTION OF COTTON.

The manufacture of cotton goods has had a rapid growth in recent years. In 1900 the world's consumption of cotton was about 15,000,000 bales, whereas for the year just ended the total was in excess of 21,000,000 bales. Formerly the manufacture of cotton was confined largely to England and to a few localities in other countries, but the industry has spread to such an extent that at the present time there are very few countries without some cotton factories. The spinning of cotton by power-driven machinery is now carried on extensively in the several European countries, in India, Japan, Brazil, Canada, and China, and to a less extent in Mexico, Turkey, Indo-China, Egypt, and a number of countries in South and Central America.

As previously stated, few countries have provided adequate systems of determining the production and consumption of cotton, notwithstanding the interest attaching to this staple. The data, therefore, must be secured from trade publications and other miscellaneous sources and by correspondence. The compilation of satisfactory statistics has been made well-nigh impossible because of the war in Europe, where all of the largest cotton-manufacturing countries are belligerents. In 1913 these countries contained about 65 per cent of the world's cotton spindles and consumed about 50 per cent of all the cotton used.

During the past season a considerable increase in the number of spindles has been made in the United States; there were also some additions in the United Kingdom, India, Japan, China, and several of the less important of the cotton-spinning countries. No satisfactory information as to the number of cotton spindles active during the past season in some of the important countries is available, and Table 42 has, therefore, been reproduced from a former census report. This table shows, by countries, the number of active cotton spindles for the years 1900 and 1914. It was compiled from a number of sources, and, while absolute accuracy is not claimed for all the figures, it is believed they closely approach the facts.

The information available as to the consumption of cotton during the season of 1915-16 for a number of countries is very unsatisfactory. In order, however, to afford some idea as to the quantity used, Table 43 has been prepared from such sources as were available. The figures for the United States were collected and compiled by this bureau. The amounts for the United Kingdom, India, and Canada are as shown by the New York Commercial and Financial Chronicle in its annual review of the cotton movement. The amount for the Continent was obtained by combining the following items: The takings of American

cotton by the spinners on the Continent, which, as shown in the Weekly Circular of the Liverpool Cotton Association, were 2,987,000 bales; the production of cotton in the several European countries and in Asiatic Russia; the exports from Alexandria, Egypt, and from India to the Continent; the estimated imports from countries other than the United States, Egypt, and India, including those into Austria-Hungary and Germany from Turkey and into Russia from Persia, Afghanistan, and Kashgar; and an estimated amount for reduction in stocks. The amount for all other countries is an estimate based on information contained in various publications and consular reports.

TABLE 42.—WORLD'S ACTIVE COTTON SPINDLES: 1900 AND 1914.

[The statistics for the United States were collected by the Bureau of the Census. Those for other countries have been compiled from a number of sources. Among them are Ellison's Annual Review of the Cotton Trade, Liverpool; the Commercial and Financial Chronicle, New York; Cotton Facts, New York; reports of the International Federation of Master Cotton Spinners' and Manufacturers' Associations, Manchester; and statistics furnished by Mitsui & Co., Osaka; Bombay Cotton Trade Association, Bombay; and E. T. Craig, Mexico City.]

COUNTRY.	ACTIVE COTTON SPINDLES.	
	1914	1900
Total.....	146,397,000	105,681,000
United States.....	32,107,000	10,472,000
Cotton-growing states.....	12,711,000	4,368,000
All other states.....	19,396,000	15,104,000
Europe:		
United Kingdom.....	56,300,000	45,500,000
Germany.....	11,550,000	8,000,000
Russia.....	9,160,000	7,500,000
France.....	7,410,000	5,500,000
Austria-Hungary.....	4,970,000	3,300,000
Italy.....	4,820,000	1,940,000
Spain.....	2,210,000	2,615,000
Belgium.....	1,530,000	920,000
Switzerland.....	1,350,000	1,550,000
Sweden.....	560,000	360,000
Portugal.....	480,000	230,000
Netherlands.....	500,000	300,000
Denmark.....	90,000	40,000
Norway.....	65,000	35,000
Other European countries.....	200,000	130,000
India.....	6,500,000	4,045,000
Japan.....	2,750,000	1,274,000
China.....	1,000,000	550,000
Brazil.....	1,250,000	450,000
Canada.....	965,000	550,000
All other countries.....	800,000	520,000

TABLE 43.—WORLD'S CONSUMPTION OF COTTON: SEASON OF 1915-16.

COUNTRY.	Mill consumption of cotton (bales of 500 pounds net weight).
Total.....	21,011,000
United States.....	6,193,000
Cotton-growing states.....	3,414,000
All other states.....	2,779,000
Europe:	
United Kingdom.....	4,000,000
Continent.....	6,400,000
India.....	6,660,000
Japan.....	1,650,000
Canada.....	208,000
All other countries.....	900,000

# COTTONSEED PRODUCTS.

## SCOPE OF THE INDUSTRY.

The statistics given under the designation "Cottonseed products" cover the operations of the establishments engaged primarily, (1) in the delinting of cotton seed, the expressing of the oil, and the grinding of the resulting cake into meal, and (2) the refining of the crude oil. They do not cover the operations of establishments engaged in the refining of oil in connection with the manufacture of lard substitutes, oleomargarine, soap, etc., nor of establishments whose principal business is the manufacture of fertilizers but which also crush cotton seed. New uses for the products of cotton seed, which was formerly considered a waste, are constantly being found, and the scope of the industry is accordingly being enlarged.

## CHARACTER OF ESTABLISHMENT.

Formerly the mills covered by this classification were engaged almost exclusively in expressing the crude oil. With the development of the industry and the utilization of cottonseed meal in the manufacture of fertilizers, however, a number of establishments have taken up the refining of the crude oil or the mixing of fertilizers. Accordingly, during the season of 1913-14 the mills classified under "Cottonseed products" included 662 engaged in crushing only, 20 in refining only, 15 in both crushing and refining, 180 in crushing and mixing fertilizers, and 5 in the manufacture of hull fiber and the grinding and pressing of cake for export. A very few were also engaged in the mixing of cattle feed.

## LOCATION OF MILLS.

By reason of climatic conditions the production of cotton is confined to about one-sixth of the United States. The seed, which forms the material of the crude mills, is bulky and the transportation charges are so high as to make its shipment for long distances unprofitable except in unusual circumstances. As a result, practically all of the cottonseed-oil mills are located within the cotton belt, usually in the localities in which the seed is produced. Although there are a few mills located outside the cotton belt, the number is small and shows no tendency to increase.

## PERIOD COVERED.

Generally speaking, the last manufactures census related to the calendar year 1914; but in view of the fact that the cottonseed-products industry is a seasonal one, it was decided to have the statistics cover the season of 1913-14, thus permitting the concerns interested to make their reports for the business year and, at the same time, relate to a uniform season. Such statistics are obviously of greater value than if some of the reports related to one season, others to another season, and still others to parts of two seasons.

## SUMMARY IN COMPARISON WITH EARLIER CENSUSES.

The statistics of the establishments engaged in the cottonseed-products industry in the United States are summarized in Table 44 for each census from 1889 to 1914, inclusive.

TABLE 44.—COMPARATIVE SUMMARY AND PERCENTAGES OF INCREASE FOR THE COTTONSEED-PRODUCTS INDUSTRY IN THE UNITED STATES: 1889 TO 1914.

	NUMBER OR AMOUNT.					PER CENT OF INCREASE. <sup>1</sup>			
	1914	1909	1904	1899	1889	1909-1914	1904-1909	1899-1904	1889-1899
Number of establishments.....	882	817	715	369	119	8.0	14.3	93.8	210.1
Persons engaged in the industry.....	27,047	21,273	13,831	12,658	( <sup>2</sup> )	27.1	13.0	48.8	( <sup>2</sup> )
Proprietors and firm members.....	180	110	63	82	( <sup>2</sup> )	63.6	74.6	-23.2	( <sup>2</sup> )
Salaried employees.....	5,057	4,092	3,229	1,569	395	23.6	26.7	105.8	297.2
Wage earners (average number).....	21,810	17,071	15,539	11,007	5,906	27.8	9.9	41.2	86.4
Primary horsepower.....	249,781	192,342	150,246	74,008	25,756	29.9	26.0	103.0	187.3
Capital.....	\$118,073,075	\$91,086,411	\$73,770,417	\$34,451,461	\$12,808,896	29.6	23.5	114.1	169.0
Salaries and wages.....	14,409,448	10,130,119	7,899,851	4,722,711	1,907,827	42.2	28.2	67.3	147.5
Salaries.....	5,919,756	4,294,870	3,062,157	1,579,252	414,047	37.8	40.3	93.9	281.4
Wages.....	8,489,692	5,835,249	4,837,694	3,143,459	1,493,780	45.5	20.6	53.9	110.4
Contract work.....	32,504	42,600	71,371	22,947	( <sup>2</sup> )	-23.7	-40.3	211.0	( <sup>2</sup> )
Rent and taxes.....	1,095,741	776,559	539,914	275,901	( <sup>2</sup> )	41.1	43.8	95.7	( <sup>2</sup> )
Materials.....	180,976,413	119,833,475	80,029,863	45,165,823	14,363,126	61.0	49.7	77.2	214.5
Value of products.....	212,127,024	147,867,894	96,407,621	58,726,632	19,335,947	43.5	53.4	64.2	203.7
Value added by manufacture (value of products less cost of materials).....	31,150,611	28,034,419	16,377,753	13,560,809	4,972,821	11.1	71.2	20.8	172.7

<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Comparable figures not available.

In 1914 there were 882 establishments engaged primarily in the manufacture of cottonseed products. This is an increase of 65 establishments as compared with 1909, and of 167 establishments as compared with 1904, while the number has more than doubled since 1899. The number of persons engaged in

the industry shows an increase of 27.1 per cent from 1909 to 1914; capital increased 29.6 per cent; salaries and wages, 42.2 per cent; materials, 51 per cent; and value of products, 43.5 per cent. The increases in the cost of materials and in the value of products are out of proportion to the increases in the number



COTTON PRODUCTION AND DISTRIBUTION.

GENERAL STATISTICS, BY STATES.

of persons engaged in the industry and in salaries and wages, but this fact is explained by the general increases in the average cost of seed and in the values of the several crude products manufactured. While these factors are not as pronounced as they would be for the season of 1915-16, still they are noticeable and show the tendency in the industry. When it is considered that cotton seed was deemed practically worthless only 25 years ago, the value of products for 1914, \$212,127,024, is surprisingly large.

The principal data secured by the census inquiry concerning the cottonseed-products industry are presented, by states, in Table 45, which shows, for the last five censuses, the number of establishments, average number of wage earners, primary horsepower, capital, wages, cost of materials, value of products, and value added by manufacture.

TABLE 45.—COMPARATIVE SUMMARY FOR COTTONSEED PRODUCTS, BY STATES: 1889 TO 1914.

	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Capital.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
United States.....	1914	882	21,810	249,781	\$118,073	\$8,490	\$180,976	\$212,127	\$31,151
	1909	817	17,071	192,842	91,086	5,835	119,833	147,868	28,035
	1904	715	15,539	150,246	73,771	4,838	80,030	96,408	16,378
	1899	399	11,007	74,008	34,451	3,143	45,166	58,727	13,561
	1889	119	5,906	12,809	12,809	1,494	14,363	19,336	4,973
Alabama.....	1914	84	2,028	21,671	8,336	697	12,340	14,982	2,642
	1909	71	1,613	17,215	7,202	437	7,075	9,178	2,103
	1904	58	1,400	12,883	5,169	381	4,554	5,769	1,215
	1899	28	759	6,714	1,610	197	2,104	2,986	682
	1889	9	490	592	592	86	945	1,204	259
Arkansas.....	1914	43	1,165	13,001	5,836	511	7,600	9,249	1,649
	1909	44	1,086	13,029	5,239	441	6,605	7,789	1,784
	1904	42	922	9,888	4,105	329	4,200	4,940	740
	1899	20	667	5,170	2,485	233	1,996	3,189	1,183
	1889	8	511	1,489	1,489	159	1,319	1,882	563
Georgia.....	1914	153	4,212	43,143	18,819	1,376	27,236	32,715	5,479
	1909	142	2,888	20,510	12,720	847	19,440	23,641	4,201
	1904	112	2,307	20,850	11,528	608	11,262	13,540	2,278
	1899	43	1,591	9,863	4,098	354	6,229	8,064	1,885
	1889	17	751	992	992	146	1,280	1,070	361
Louisiana.....	1914	37	1,127	11,097	7,217	487	16,165	18,106	1,941
	1909	48	894	12,142	7,164	818	11,568	13,088	1,517
	1904	51	1,605	12,698	8,687	501	11,477	13,187	1,710
	1899	24	1,317	4,821	4,622	347	5,792	7,027	1,235
	1889	7	387	1,083	1,083	130	1,058	1,573	515
Mississippi.....	1914	67	2,336	25,272	9,378	850	14,438	17,600	3,162
	1909	87	2,503	24,534	10,133	833	12,169	15,965	3,796
	1904	91	2,499	20,150	8,552	732	10,070	12,587	2,517
	1899	41	1,521	8,961	3,712	401	4,953	6,681	1,728
	1889	13	891	1,498	1,498	211	1,758	2,407	649
North Carolina.....	1914	62	1,586	15,874	8,434	536	13,114	15,289	2,155
	1909	58	1,165	9,641	4,432	326	7,090	8,504	1,414
	1904	43	897	7,935	3,118	233	2,956	3,749	793
	1899	21	564	2,913	1,842	133	2,161	2,677	516
	1889	11	318	744	744	57	402	530	128
Oklahoma.....	1914	60	851	16,315	6,465	360	6,283	7,500	1,307
	1909	39	581	10,720	5,071	235	4,245	5,187	942
	1904	24	496	6,005	2,590	182	2,353	3,109	756
	1899	12	222	2,286	719	70	605	874	209
South Carolina.....	1914	97	2,037	24,690	9,067	639	13,643	16,880	2,787
	1909	103	1,765	17,780	6,880	467	8,719	10,903	2,184
	1904	100	1,282	14,500	5,177	320	4,553	5,403	910
	1899	50	734	5,785	1,900	144	2,363	3,104	741
	1889	17	416	565	565	56	741	928	187
Tennessee.....	1914	24	1,054	10,802	5,076	418	9,202	11,414	2,212
	1909	20	803	7,472	3,731	290	5,201	6,593	1,392
	1904	20	701	6,606	2,814	245	3,084	3,744	660
	1899	17	751	4,466	1,897	204	2,278	2,980	702
	1889	15	1,030	1,833	1,833	184	1,749	2,505	756
Texas.....	1914	233	4,471	60,772	27,974	2,087	36,177	41,945	5,788
	1909	194	3,078	45,185	21,506	1,296	23,439	29,916	9,477
	1904	157	2,730	39,980	14,180	1,020	15,805	18,699	2,894
	1899	103	2,478	21,959	7,887	831	10,373	14,005	3,633
	1889	13	866	2,359	2,359	320	2,532	3,262	730
All other states <sup>1</sup> .....	1914	22	943	7,144	11,476	529	24,778	28,877	2,099
	1909	21	692	5,164	7,003	545	14,882	17,107	2,225
	1904	17	721	4,363	7,751	227	9,716	11,621	1,905
	1899	10	403	2,070	3,419	169	6,312	7,140	823
	1889	9	246	1,654	1,654	139	2,570	3,375	805

<sup>1</sup> Includes establishments distributed as follows: For 1914—Arizona, 1; California, 1; Florida, 4; Illinois, 2; Kansas, 1; Kentucky, 2; Missouri, 5; New Jersey, 2; Ohio, 1; Rhode Island, 1; and Virginia, 2. For 1909—Florida, 5; Illinois, 2; Kansas, 1; Kentucky, 4; Missouri, 4; New Jersey, 1; Ohio, 1; Rhode Island, 1; and Virginia, 1. For 1904—Florida, 3; Illinois, 2; Kentucky, 3; Missouri, 4; New Jersey, 1; Ohio, 1; Rhode Island, 1; and Virginia, 2. For 1899—Florida, 1; Illinois, 1; Kansas, 1; Kentucky, 3; Missouri, 2; Ohio, 1; and Rhode Island, 1. For 1889—Florida, 2; Kentucky, 2; New York, 3; Ohio, 1; and Rhode Island, 1.

Texas leads all other states in the number of cottonseed-oil mills, reporting 233 for 1914, being followed in this respect by Georgia with 153, South Carolina with 97, and Alabama with 84, in the order in which named. Mississippi shows a loss of 20 establishments and Louisiana 6, as compared with

COTTONSEED PRODUCTS.

1909, while Texas, Oklahoma, and Alabama all show large gains. The industry has declined in the two states mentioned because of the boll weevil, a number of mills in each state standing idle.

Texas is also first in the value of products, with a total of \$41,945,000, being followed by Georgia with

\$32,715,000. The large increases in the values of products reported for the several states are due to some extent to the increased prices of commodities generally, rather than to increases in the actual quantities of products manufactured. Table 46 presents more detailed statistics, by states, for 1914.

TABLE 46.—DETAILED STATEMENT FOR COTTONSEED PRODUCTS, BY STATES: 1914.

	United States.	Alabama.	Arkansas.	Georgia.	Louisiana.	Mississippi.
Number of establishments.....	882	84	43	153	37	67
Persons engaged in the industry, total.....	27,047	2,499	1,419	5,117	1,463	2,775
Proprietors and firm members.....	180	15	3	17	3	16
Salaried officers, superintendents, and managers.....	2,464	241	105	450	99	220
Clerks, etc., total.....	2,593	215	146	438	234	203
Male.....	2,455	202	141	415	220	184
Female.....	138	13	5	23	14	9
Wage earners:						
Average number.....	21,810	2,028	1,165	4,212	1,127	2,336
Number, fifteenth day of month:						
Maximum—						
Month.....	November.	November.	December.	October.	November.	December.
Number.....	36,838	3,354	2,141	6,686	1,952	3,964
Minimum—						
Month.....	June.	July.	July.	July.	May.	June.
Number.....	7,063	573	286	1,234	468	754
Wage earners, Dec. 15, or nearest representative day, total.....	37,155	3,382	2,218	6,658	1,862	3,968
16 years of age and over.....	37,118	3,382	2,218	6,649	1,862	3,957
Male.....	37,030	3,374	2,216	6,642	1,837	3,947
Female.....	88	8	2	7	25	10
Under 16 years of age.....	37			9		11
Male.....	36			9		11
Female.....	1					
Capital.....	\$118,073,075	\$8,336,078	\$5,835,766	\$18,818,461	\$7,217,032	\$9,872,992
Salaries and wages, total.....	\$14,409,448	\$1,178,899	\$809,276	\$2,398,642	\$674,082	\$1,378,732
Officials.....	\$3,701,838	\$320,514	\$177,081	\$617,872	\$201,848	\$338,732
Clerks, etc.....	\$2,217,918	\$161,842	\$120,869	\$344,834	\$285,051	\$190,155
Wage earners.....	\$8,489,692	\$697,043	\$510,726	\$1,375,936	\$487,163	\$840,645
Contract work.....	\$32,504		\$1,997	\$18,145		\$199
Rent and taxes, total.....	\$1,095,741	\$30,152	\$55,087	\$108,892	\$70,378	\$145,282
Rent of factory.....	\$64,126	\$11,038	\$625	\$15,302	\$7,000	\$14,053
Taxes, including internal-revenue and corporation income.....	\$1,031,615	\$19,114	\$55,092	\$153,560	\$63,318	\$131,229
Cost of materials, total.....	\$180,970,413	\$12,340,130	\$7,600,356	\$27,235,920	\$16,165,351	\$14,437,923
Principal materials.....	\$176,955,903	\$12,037,414	\$7,405,718	\$26,538,716	\$15,921,955	\$14,055,171
Fuel and rent of power.....	\$4,010,450	\$302,716	\$194,638	\$697,204	\$243,396	\$381,057
Value of products.....	\$212,127,024	\$14,982,159	\$9,249,457	\$32,714,801	\$18,106,257	\$17,599,051
Value added by manufacture (value of products less cost of materials).....	\$31,156,611	\$2,642,029	\$1,649,101	\$5,478,881	\$1,940,906	\$3,162,623
Primary horsepower, total.....	249,781	21,671	13,001	43,143	11,097	25,272
Steam engines.....	218,872	19,192	12,470	36,853	8,564	24,559
Internal-combustion engines.....	1,783	1,386	130	1,083	1,511	143
Electric (rented).....	23,126	1,843	395	6,207	1,032	370
Electric horsepower generated in establishments reporting.....	7,767	417	222	650	1,164	998

	North Carolina.	Oklahoma.	South Carolina.	Tennessee.	Texas.	All other states.
Number of establishments.....	62	60	97	24	233	22
Persons engaged in the industry, total.....	1,928	1,110	2,537	1,270	5,649	1,280
Proprietors and firm members.....	3	11	15	1	95	1
Salaried officers, superintendents, and managers.....	185	155	286	71	588	64
Clerks, etc., total.....	154	93	199	144	495	272
Male.....	142	83	186	136	433	253
Female.....	12	10	13	8	12	19
Wage earners:						
Average number.....	1,586	851	2,037	1,054	4,471	943
Number, fifteenth day of month:						
Maximum—						
Month.....	February.	December.	November.	November.	November.	.....
Number.....	2,464	1,718	3,379	1,957	7,958	.....
Minimum—						
Month.....	July.	June.	July.	August.	June.	.....
Number.....	478	190	545	398	1,297	.....
Wage earners, Dec. 15, or nearest representative day, total.....	2,452	1,730	3,419	1,825	8,149	1,492
16 years of age and over.....	2,440	1,730	3,415	1,825	8,143	1,492
Male.....	2,438	1,730	3,413	1,812	8,138	1,485
Female.....	2		2	13	12	7
Under 16 years of age.....	12		4		1	
Male.....	12		4			
Female.....					1	
Capital.....	\$3,434,016	\$6,465,224	\$9,066,593	\$5,076,407	\$27,974,397	\$11,476,109
Salaries and wages, total.....	\$926,341	\$651,029	\$1,113,982	\$686,385	\$3,406,200	\$945,830
Officials.....	\$263,075	\$220,913	\$320,646	\$161,709	\$893,036	\$185,812
Clerks, etc.....	\$127,443	\$70,158	\$154,005	\$106,159	\$426,624	\$231,248
Wage earners.....	\$535,828	\$359,958	\$639,331	\$418,517	\$2,086,540	\$628,820
Contract work.....	\$60	\$1,395	\$157	\$5,881	\$3,247	\$1,423
Rent and taxes, total.....	\$65,277	\$75,362	\$82,786	\$36,495	\$247,292	\$68,168
Rent of factory.....	\$1,500	\$1,310	\$4,653	\$988	\$7,852	\$845
Taxes, including internal-revenue and corporation income.....	\$63,777	\$74,052	\$78,133	\$36,107	\$239,440	\$67,323
Cost of materials, total.....	\$13,114,155	\$5,283,403	\$13,642,921	\$9,201,489	\$36,176,576	\$24,778,484
Principal materials.....	\$12,829,926	\$6,121,638	\$13,253,366	\$9,059,085	\$35,179,801	\$24,542,373
Fuel and rent of power.....	\$284,229	\$161,765	\$389,555	\$142,404	\$996,775	\$236,111
Value of products.....	\$15,269,564	\$7,589,813	\$16,379,858	\$11,414,243	\$41,944,689	\$26,876,732
Value added by manufacture (value of products less cost of materials).....	\$2,155,209	\$1,306,410	\$2,736,937	\$2,212,764	\$5,768,113	\$2,098,248
Primary horsepower, total.....	16,315	10,802	24,690	10,802	70,772	7,144
Steam engines.....	14,098	15,690	18,280	10,659	54,697	4,820
Internal-combustion engines.....	11	416	1,102	123	1,547	575
Electric (rented).....	1,765	209	5,308	20	4,528	1,749
Electric horsepower generated in establishments reporting.....	963	133	378	568	1,802	972

1 Includes 18 water wheels and motors with 1,035 horsepower, reported as follows: 2 with 120 horsepower, in Alabama; 1 with 50 horsepower, in Oklahoma; 12 with 545 horsepower, in South Carolina; 3 with 320 horsepower, in Texas.

## COTTON PRODUCTION AND DISTRIBUTION.

## PERSONS ENGAGED IN THE INDUSTRY.

Table 47 shows, for 1909 and 1914, the number of persons engaged in the cottonseed-products industry, classified by occupational status and sex, and, in the case of wage earners, according to age. It should be borne in mind that the sex and age classifications of the average number of wage earners in this and other tables are estimated on the basis of the distribution on the actual numbers reported for the representative day.

The average number of wage earners is obtained by adding together the numbers employed on the fifteenth days of the twelve months and dividing the total thus obtained by 12. It represents the approximate number who would have been required to perform the work if all had been continuously employed during the year, and is therefore considerably smaller than the number actually employed during the height of the season.

TABLE 47.—COMPARATIVE STATEMENT OF PERSONS ENGAGED, BY CLASSES AND BY SEX: 1914.

CLASS.	Cen- sus year.	PERSONS ENGAGED IN THE INDUSTRY.				
		Total.	Male.	Female.	Per cent of total.	
					Male.	Fe- male.
All classes.....	1914 1909	27,047 21,273	26,843 21,169	204 113	99.2 99.5	0.8 0.5
Proprietors and officials.....	1914 1909	2,644 2,167	2,631 2,162	13 5	99.5 99.8	0.5 0.2
Proprietors and firm members.....	1914 1909	180 110	175 108	5 2	97.2 98.2	2.8 1.8
Salaried officers of corporations.....	1914 1909	613 576	605 573	8 3	98.7 99.5	1.3 0.5
Superintendents and managers.....	1914 1909	1,851 1,481	1,851 1,481	..... .....	100.0 100.0	..... .....
Clerks and other subordinate salaried employees.....	1914 1909	2,593 2,035	2,455 1,956	138 79	94.7 96.1	5.3 3.9
Wage earners (average number).....	1914 1909	21,810 17,071	21,757 17,042	53 29	99.8 99.8	0.2 0.2
15 years of age and over.....	1914 1909	21,788 17,018	21,736 16,990	52 28	99.8 99.8	0.2 0.2
Under 15 years of age.....	1914 1909	22 53	21 52	1 1	95.5 98.1	4.5 1.9

The average number of persons engaged in the industry in 1914 was 27,047, of whom 21,810, or 80.6 per cent, were wage earners; 2,644, or 9.8 per cent, proprietors and officials; and 2,593, or 9.6 per cent, clerks and other subordinate employees. Of the total, 26,843, or 99.3 per cent, were males. The numbers of females of all ages and of males under 16 years of age employed as wage earners were so small as to be negligible. The average numbers of wage earners for each state, as reported at the last five censuses, are given in Table 45, while Table 46 shows by states the sex and age distribution of the wage earners employed on December 15, 1913, or the nearest representative day.

*Wage earners employed, by months.*—The following table gives the number of wage earners employed on the 15th of each month, as returned at the censuses of 1904, 1909, and 1914. It shows, also, the percentage which the number reported for each month is of the greatest number reported for any month.

TABLE 48.—WAGE EARNERS EMPLOYED, BY MONTHS: 1904, 1909, AND 1914.

MONTH.	WAGE EARNERS IN THE INDUSTRY.					
	Number. <sup>1</sup>			Per cent of maximum.		
	1914	1909	1904	1914	1909	1904
January.....	32,450	25,067	24,008	88.1	87.5	90.1
February.....	28,065	22,388	22,327	76.2	76.3	80.5
March.....	21,368	18,032	17,055	58.0	61.5	61.5
April.....	13,561	11,190	10,579	36.8	38.1	38.1
May.....	8,421	7,445	6,380	22.9	25.4	25.0
June.....	7,063	5,635	5,130	19.2	19.2	18.5
July.....	7,361	5,174	4,254	20.0	17.6	15.3
August.....	10,015	6,038	5,715	27.2	20.6	17.0
September.....	24,787	16,058	12,186	67.3	57.8	43.9
October.....	35,478	28,203	25,172	96.3	93.5	90.8
November.....	36,838	29,334	27,735	100.0	100.0	100.0
December.....	36,304	28,677	25,948	98.6	97.8	93.6

<sup>1</sup> The figures for 1914 and 1909 represent the number employed on the 15th of each month, or the nearest representative day; those for 1904, the average number employed during the month.

The number of wage earners employed in the industry varies greatly throughout the year. The crushing season begins in southern Texas in July and is at its height throughout the cotton belt from October to January. By that time many of the mills have finished the crush, although a number of the larger ones obtain a sufficient quantity of seed to operate far into the summer. The number of wage earners reported for June, formed 19.2 per cent of the number reported for November.

## PREVAILING HOURS OF LABOR.

The prevailing hours of labor per week in the oil mills was 72, the average number of wage earners in establishments falling within this range forming 67.9 per cent of the total.

## CHARACTER OF OWNERSHIP.

Of the establishments engaged in the manufacture of cottonseed products during the season of 1913-14, 793 were operated by corporations, 47 by individuals, and 42 by firms. Of the wage earners, 20,535, or 94.1 per cent, were employed by corporations; 777, or 3.6 per cent, by individuals; and 498, or 2.3 per cent, by firms. The proportions of the total value of products reported by establishments under the three forms of ownership were as follows: Corporations, 95.7 per cent; individuals, 2.6 per cent; and firms, 1.7 per cent.

## SIZE OF ESTABLISHMENTS.

For the season of 1913-14 only 39 establishments, or 4.5 per cent, had a product of less than \$20,000 each; 249, or 28.2 per cent, reported from \$20,000 to \$100,000; 569, or 64.5 per cent, from \$100,000 to \$1,000,000; and 25, or 2.8 per cent, a product of \$1,000,000 and over. The mills in the last two groups combined—that is, all those having products valued at \$100,000 or more—constituted 67.3 per cent of the total number of establishments, employed 86.7 per cent of the wage earners, and reported 92.5 per cent of the total value of products; while those having products valued at less than \$100,000, although their number constituted almost one-third of the total, reported only 7.5 per cent of the total value of products.

ENGINES AND POWER.

Table 49 shows for the cottonseed-oil mills the numbers of engines and other motors, according to their character, employed in generating power (including electric motors operated by rented current), together

with their total horsepower, as reported at the last five censuses. It also shows separately the number and horsepower of electric motors (a) operated by rented current and (b) operated by current generated in the establishment using them.

TABLE 49.—NUMBER AND HORSEPOWER OF ENGINES AND MOTORS: 1904, 1909, AND 1914.

POWER.	NUMBER.			HORSEPOWER.					
	1914	1909	1904	Amount.			Per cent distribution.		
				1914	1909	1904	1914	1909	1904
Primary power, total.....	2,326	1,674	1,232	249,781	192,342	150,246	100.0	100.0	100.0
Owned.....	1,700	1,477	1,232	226,655	185,478	149,588	90.7	96.4	99.6
Steam engines and turbines <sup>1</sup> .....	1,523	1,434	1,210	218,872	183,620	148,914	87.6	95.4	99.1
Internal-combustion engines.....	159	38	10	6,748	1,674	115	2.7	0.9	0.1
Water wheels, turbines, and motors.....	18	5	12	1,035	175	559	0.4	0.1	0.4
Rented.....	626	197	( <sup>2</sup> )	23,126	6,864	658	9.3	3.6	0.4
Electric.....	626	197	( <sup>2</sup> )	23,126	6,394	658	9.3	3.3	0.4
Other.....					470			0.3	
Electric power, total.....	998	455		30,893	10,855	3,079	100.0	100.0	100.0
Rented.....	626	197	( <sup>2</sup> )	23,126	6,394	658	74.9	58.9	21.4
Generated by establishments reporting.....	372	258	138	7,767	4,461	2,421	25.1	41.1	78.6

<sup>1</sup> Figures for horsepower include, for 1909 and 1904, the amount reported under the head of "Other" owned power.

<sup>2</sup> Not reported.

The total primary power reported for the industry amounted to 150,246 horsepower in 1904, 192,342 in 1909, and 249,781 in 1914. Steam power constituted 99.1 per cent of the total in 1904, 95.4 per cent in 1909, and 87.6 per cent in 1914. The decrease in the proportion of steam power since 1904 has been due to the relatively large increase in the use of electric motors run by purchased current (rented electric power). The leading states in this respect were Georgia, South Carolina, and Texas, in the order named; these three states combined reporting 16,043 horsepower, more than two-thirds of the total rented power for the industry.

FUEL.

Closely related to the subject of power is that of fuel. The combined cost of fuel and rent of power for the industry in 1914, as shown by Table 46, was \$4,010,450. The fuel consumed, as shown in the following table, comprised 5,507 tons of anthracite coal, 1,232,031 tons of bituminous coal, 1,762 tons of coke, 248,806 barrels of oil, and 1,519,198 cubic feet of gas.

TABLE 50.—FUEL USED, BY KINDS AND BY STATES: 1914.

STATE.	COAL.		Coke (tons of 2,000 lbs).	Oil, including gasoline (barrels).	Gas (1,000 cubic feet).
	Anthracite (tons of 2,240 lbs).	Bituminous (tons of 2,000 lbs).			
United States.....	5,507	1,232,031	1,762	248,806	1,519,198
Alabama.....		131,729	400	126	15,000
Arkansas.....		60,555		3,764	214,406
Georgia.....		179,107	267	185	
Louisiana.....	604	38,367		85,631	204,110
Mississippi.....		163,184	1,000		
North Carolina.....		70,862		72	
Oklahoma.....		46,249		1,207	356,054
South Carolina.....	500	98,143		130	
Tennessee.....		78,532		361	
Texas.....	870	310,173		139,079	729,628
All other states.....	3,533	60,080	95	18,250	

A number of mills also reported wood, but no data as to the quantity were collected.

Practically all the oil reported was for Louisiana and Texas; and these states, together with Arkansas and Oklahoma, reported almost the entire quantity of gas. The proximity of the mills in these states to the gas wells affords a cheap and convenient fuel.

MATERIALS AND PRODUCTS.

The special schedule used for collecting the statistics of the cottonseed-products industry provided for reporting the quantities of cotton seed and of crude oil purchased and the quantities and values of the various products manufactured. Table 51 shows these statistics, so far as available, for the industry as a whole.

TABLE 51.—DETAILED STATEMENT OF MATERIALS AND PRODUCTS: 1914.

ITEM.	Quantity.	Cost or value.
Cotton seed crushed, tons.....	4,790,774	\$121,930,626
Crude oil purchased, gallons.....	80,704,213	34,203,783
Products, total value.....		212,127,024
Crude oil produced, total gallons.....	191,163,261	
For consumption in mill, gallons.....	8,040,989	
For sale, gallons.....	183,122,272	76,854,163
Cake and meal produced, total tons.....	2,191,610	
For consumption in mill, tons.....	73,911	
For sale, tons.....	2,117,699	53,511,933
Hulls produced, total tons.....	1,385,940	
For consumption in mill, tons.....	12,187	
For sale, tons.....	1,373,753	10,963,518
Linters, pounds.....	330,624,502	7,621,091
Refined oil, gallons.....	72,749,741	38,789,628
Soap stock, pounds.....	83,680,480	1,284,203
Fertilizer, tons.....	402,417	8,630,355
All other products, value.....		13,083,456
Amount received from custom ginning.....		1,388,647
Equipment:		
Linters and delinting machines, number.....	8,354	
Hullers.....	1,603	
Presses.....	3,117	

The statistics presented in the foregoing table relate only to establishments engaged primarily in the manufacture of cottonseed products. There-

COTTON PRODUCTION AND DISTRIBUTION.

fore some establishments which crush cotton seed in connection with some other line of manufacture are classified other than cottonseed products; however, to enable a complete statistical presentation, the census inquiry called for the quantity and cost of cotton seed crushed and the total production of the several crude products derived therefrom, whether sold as such or used as intermediate products in further processes of manufacture, such as the refining of oil and the mixing of fertilizer and feed.

Table 52 shows, by states, the number of establishments engaged in crushing cotton seed, the quantities and cost of seed crushed, and the quantities and values of the crude products, as returned at each census of manufactures from 1899 to 1914, inclusive. The totals shown in the table include estimates as to the value of the crude products when not sold, these values being computed on the basis of the average prices obtained for those sold.

Between 1899 and 1914 the number of establishments engaged in crushing cotton seed increased from 357 to 872, or 144.3 per cent, and the quantity of seed crushed from 2,479,386 tons to 4,847,628 tons, or 95.5 per cent. The number of active mills has increased since 1909 in all of the states except Louisiana

and Mississippi, where the industry has been greatly affected by the boll weevil, and Arkansas and South Carolina, which show slight losses in number of mills operated. Texas shows an increase of 37 establishments, compared with 1909; Oklahoma, 21; Alabama, 15, and Georgia, 10. All of the states, with the exception of Mississippi, show an increase in the quantity of seed crushed, Texas and Georgia, each with an increase of more than 270,000 tons, leading.

The average quantity of seed crushed per mill was 5,559 tons. This average exceeded that for 1904 and 1909, but was less than in 1899. When the oil-mill industry was first established, the mills were located in the more important centers. These centrally located mills were usually of large capacity and obtained part of their seed supply, in some instances, from considerable distances. With the development of the industry, however, many mills have been established in the smaller towns, and these, as a rule, are of smaller capacity and depend largely on the immediate vicinity for their seed supply. Tennessee, with an average crush per mill of 11,629 tons in 1913-14, leads all other states in this regard. This is accounted for by the fact that Memphis is the most important cottonseed-crushing center in the world.

TABLE 52.—COMPARATIVE SUMMARY OF THE QUANTITY AND COST OF COTTON SEED CRUSHED AND OF THE QUANTITIES AND VALUES OF CRUDE PRODUCTS MANUFACTURED, BY STATES: 1899, 1904, 1909, AND 1914.

Table with columns for STATE, Year, COTTON SEED CRUSHED (Tons, Cost, Consumption per mill (tons), Total value), and CRUDE COTTONSEED PRODUCTS (Oil: Gallons, Value; Meal and cake: Tons, Value; Hulls: Tons, Value; Linters: Pounds, Value).

In the following statement the establishments represented in the preceding table for the season of 1913-14 are classified according to the quantity of seed crushed.

STATE.	NUMBER OF COTTONSEED-OIL MILLS.						
	Total.	Crushing—					
		Less than 1,000 tons.	1,000 but less than 2,000 tons.	2,000 but less than 5,000 tons.	5,000 but less than 10,000 tons.	10,000 but less than 20,000 tons.	20,000 tons and over.
United States...	872	68	103	339	253	86	23
Alabama.....	86	9	12	27	29	7	2
Arkansas.....	43	3	2	10	19	8	1
Georgia.....	155	14	21	73	26	14	7
Louisiana.....	32	1	3	18	5	5	.....
Mississippi.....	69	2	6	22	23	13	3
North Carolina.....	63	6	8	27	15	5	2
Oklahoma.....	60	9	6	18	25	2	.....
South Carolina.....	98	9	27	35	19	6	2
Tennessee.....	23	.....	1	1	10	9	2
Texas.....	229	13	17	107	74	15	3
All other states.....	14	2	.....	1	8	2	1

Of the mills operated during the season, 171 crushed less than 2,000 tons each from the crop of 1913; 510, or 58.5 per cent of the total number, crushed less than 5,000 tons each; and 763, or 87.5 per cent, less than 10,000 tons each. There were 109 mills, each of which crushed 10,000 tons or more, and these together reported more than 35 per cent of the total quantity of seed crushed.

The total cost of seed for the season of 1913-14, as delivered at the mill, thus including freight and commission, was \$123,335,299. The average cost per ton was \$25.44, which compares with \$20.41 for 1909 and \$11.55 for 1899. The average was higher than that for the United States in Alabama, Georgia, North Carolina, and South Carolina, and lower in Arkansas, Louisiana, Oklahoma, and Texas. North Carolina, with \$29.76, shows the highest average cost per ton of seed, and Louisiana, with \$21.14, the lowest. A number of factors must be considered in accounting for wide differences in the cost of seed throughout the cotton belt, among others being the oil content of the seed, proximity of the supply, home markets for products, and competition.

The total value of crude cottonseed products manufactured during the season of 1913-14 amounted to \$156,036,437, compared with \$107,528,204 in 1909, \$69,310,624 in 1904, and \$42,411,835 in 1899. Compared with 1909, all of the states, with the exception of Louisiana, show an increase. The average value of products per ton of seed crushed was \$17.11 in 1899, \$20.72 in 1904, \$28.10 in 1909, and \$32.19 in 1914. The average varies greatly for the different states, ranging for the season of 1913-14 from \$27.16 in Louisiana and \$28.43 in Arkansas to \$36.10 in North Carolina, and \$35.95 in South Carolina. The comparatively low averages for Louisiana and Arkansas may be accounted for, in part, by the poor condi-

tion of the seed, due to an unusually wet season. In 1914 oil represented 51.9 per cent of the total value of crude products; meal and cake, 36 per cent; hulls, 7.2 per cent; and linters, 4.9 per cent. These proportions are practically identical with those for 1909.

The average value of oil produced during the season of 1913-14 was 41.9 cents per gallon; of cake and meal, \$25.30 per ton; of hulls, \$7.99 per ton; and of linters, 2.3 cents per pound. The fluctuations in the average values of the several products for the three census years are due, in a large measure, to the fluctuations in the market values of products with which they come into competition. For instance, the price of oil is affected by the prices of hogs' lard, soap stock, olive oil, etc., and the price of meal and cake and of hulls by those of other feedstuffs and of fertilizer materials.

The ratios which the weights of the several products in 1914 bore to the total weight of the seed when received at the mill were as follows: Crude oil, 15 per cent; cake and meal, 45.7 per cent; hulls, 28.9 per cent; and linters, 3.4 per cent; leaving a loss of 7 per cent. The corresponding percentages for 1909 were: Crude oil, 15.5; meal and cake, 43.8; hulls, 33.1; linters, 2.3; and a loss of 5.3 per cent. From a comparison of these figures it will be observed that there has been a slight decrease in the relative quantity of oil produced, a noticeable decrease in that of hulls, and increases in those of meal and cake and of linters. The reduction in the average production of hulls may be accounted for by the closer delinting of the seed and by the introduction of cold-press mills, which extract the oil from the seed without hulling, the resulting cake including the hulls. The number of these cold-press mills operated during the season of 1913-14 was 61. All of the important cotton states report some of these mills, the largest number being returned from Oklahoma. The relation among the average quantities of the several products that can be obtained from a given quantity of cottonseed depends largely upon the variety and conditions of the seed and the climatic conditions during the growing and harvesting seasons, as well as upon the efficiency of the mill.

PERIODICAL REPORTS OF COTTON SEED CRUSHED AND LINTERS OBTAINED.

The substitution of linters for long-fiber cotton in many lines of manufacture has created a demand for information as to the production. The Bureau of the Census has accordingly collected data of linters obtained and associated them with the statistics of cotton ginned. With the development of the oil-mill industry it has been found advantageous to delint the seed much more closely than was the practice but a few years ago, and some of the mills now pass the seed through the linter machine a second time. The more nearly the fiber is removed from the seed, the less is the meat carried off with the hulls and consequently the greater is the yield of oil and cake, which are the more valuable

## COTTON PRODUCTION AND DISTRIBUTION.

products. The total production of linters for each year since the inauguration of the annual reports of cotton ginned is shown in Table 3, and the production by states is given in Table 4 for the years 1911 to 1915, inclusive. Although the data relative to the production of linters have been collected in connection with the statistics of cotton ginned, information as to the quantity of cotton seed used by the oil mills in manu-

facture has been collected for only the last three years, except at the general censuses of manufactures.

Table 53 shows, by states, for the crops of 1911 to 1915, inclusive, the quantity of seed crushed, the total quantity of linters obtained, and the average quantity of linters obtained per ton of seed treated, and for 1915, the number of cottonseed-oil mills active.

TABLE 53.—NUMBER OF COTTONSEED-OIL MILLS, QUANTITY OF SEED CRUSHED, AND QUANTITY OF LINTERS OBTAINED, BY STATES: CROPS OF 1911 TO 1915.

STATE.	Active cottonseed-oil mills, number.	COTTON SEED CRUSHED.					LINTERS OBTAINED.					Average per ton of seed crushed (pounds).				
		Tons.					Running bales.									
		1915	1915	1914	1913	1912	1911	1915	1914	1913	1912	1911	1915	1914	1913	1912
United States..	844	4,202,313	5,779,665	4,767,802	4,579,508	4,921,073	944,640	832,401	631,153	602,324	556,270	106	74	67	67	57
Alabama.....	89	328,115	502,374	428,447	347,224	410,295	79,220	69,924	53,860	38,830	40,667	112	71	63	56	50
Arkansas.....	41	268,687	314,308	305,042	249,360	273,455	58,277	46,242	40,671	34,084	31,830	103	77	69	70	60
Florida.....	( <sup>1</sup> )	33,150	23,650	19,069	26,156	( <sup>1</sup> )	3,060	2,621	1,415	1,955	( <sup>1</sup> )	49	51	34	32	
Georgia.....	155	791,492	1,053,927	861,177	630,836	814,152	182,683	141,478	110,629	76,185	80,313	108	66	63	50	47
Louisiana.....	25	138,262	175,924	153,526	151,742	157,175	31,734	24,689	21,823	17,927	18,592	100	73	73	61	60
Mississippi.....	63	376,036	527,905	502,326	393,635	430,356	87,436	78,781	60,766	45,228	46,718	112	70	64	61	57
Missouri.....	4	24,540	32,226	27,994	22,419	42,271	5,370	4,062	3,399	2,433	4,217	102	68	63	56	52
North Carolina.....	67	297,633	387,765	317,955	309,800	330,784	57,599	45,497	34,968	28,720	30,131	88	58	52	43	44
Oklahoma.....	56	229,419	410,733	249,721	337,617	306,842	54,283	68,020	38,536	52,016	39,260	113	91	82	81	67
South Carolina.....	88	327,662	460,757	411,292	340,555	387,962	70,923	58,416	46,580	35,517	36,980	99	62	55	50	46
Tennessee.....	22	226,440	277,930	259,556	164,703	251,829	57,834	41,601	34,671	22,292	28,815	122	70	69	71	68
Texas.....	222	1,123,382	1,514,505	1,166,369	1,570,966	1,415,321	243,491	238,395	176,202	243,314	190,094	103	82	77	78	68
All other states.....	*12	70,645	88,161	60,747	41,582	74,475	15,790	11,327	6,397	4,345	6,687	109	66	55	54	48

\* Included in "All other states."

\* Includes Arizona, 2; California, 4; Florida, 3; Illinois, 2; and Kentucky, 1.

According to Table 53, there were 844 establishments engaged in crushing cotton seed from the crop of 1915. This number compares with 885 in 1914, 870 in 1913, 857 in 1912, and 839 in 1911.

The slight differences in cotton seed crushed and linters produced between Tables 52 and 53 for 1913 are due partly to the fact that the data for Table 53 were collected in March at the final canvass of gineries before the end of the crushing season and necessarily contain estimates for the remainder of the season and partly to the fact that Table 52 includes the reports of several establishments for the calendar year 1914 which had been idle up to the time of the March canvass.

The estimated quantity of cotton seed produced from the crop of 1915, according to Table 12, was 4,992,000 tons, which compares with 7,186,000 tons from the crop of 1914, 6,305,000 tons from the crop of 1913, 6,104,000 tons from that of 1912, and 6,997,000 tons from that of 1911. Of the total for 1915, 4,202,313 tons, or 84.2 per cent, were taken by the oil mills, thus leaving 789,687 tons, or 15.8 per cent, for planting, export, feeding, and other purposes. The proportion taken by the oil mills from the crop of 1914 was 80.4 per cent; from that of 1913, 75.6 per cent; from that of 1912, 75 per cent; and from that of 1911, 70 per cent. The proportion which the quantity of seed crushed forms of the total produced, as shown in Table 12, varies for the different states, but this is accounted for in part by the interstate shipment of seed and by differences in accessibility to the mills

and in the quantity of the seed retained for planting. Larger proportions are kept for this purpose in some localities, especially where the better varieties of cotton are grown. In Alabama, Arkansas, and South Carolina the proportion of the estimated seed production which was taken by the oil mills of those states was comparatively low; large quantities of seed grown in these states being shipped to other states for crushing. On the other hand, the amount returned by the mills in Tennessee exceeded the total production of the state. This is due to the fact that Memphis is the most important crushing center in the cotton belt and draws seed from other states, particularly Arkansas.

The average quantity of seed crushed per establishment in the United States from the crop of 1915 was 4,979 tons, which compares with 6,531, 5,480, 5,344, and 5,865 tons, respectively, for the four previous seasons. Wide variations appear in the average consumption of the mills in the different states, those in South Carolina showing the smallest and those in Tennessee the largest average crush for each of the named.

As previously stated, the quantity of linters produced increased from 114,544 equivalent 500-pound bales from the crop of 1899 to 931,141 such bales from the crop of 1915. Statistics as to the quantity of seed treated in obtaining the linters have been collected for only the last five years, but it is evident that the average production of linters per ton of seed crushed has been steadily increasing. The average for the country

as a whole was 106 pounds in 1915, 74 pounds in 1914, 67 pounds in 1913, and in 1912, and 57 pounds in 1911. This marked increase in the production of linters per ton of seed treated was due largely to the installation of improved machinery, which effects closer delinting. This practice was accelerated by the increased demand for linters in the manufacture of explosives. For 1915 Tennessee, with 122 pounds, shows the highest production per ton of seed treated, while Oklahoma, with 113 pounds, is next, followed by Alabama and Mississippi with 112 pounds.

*Cotton seed crushed and linters obtained to specified dates.*—Prior to the season of 1912-13, statistics of linters obtained by reginning cotton seed were collected only in March of each year. For the crop of 1912 data were also collected showing the quantity of

seed crushed and linters obtained to January 1, and for the crops of 1913, 1914, and 1915, the quantities to December 1 and January 1. This information is given, by states, in Table 54.

Prior to January 1 of the following year 2,615,352 tons of cotton seed from the crop of 1915 had been crushed, 3,338,176 tons from the crop of 1914, 3,012,685 tons from the crop of 1913, and 2,739,897 tons from that of 1912. These amounts represent, respectively, 62.2 per cent, 57.8 per cent, 63.2 per cent, and 59.8 per cent of the totals crushed for the four seasons. Up to December 1 the mills treated 46.6 per cent of the total quantity of seed crushed from the crop of 1915, as against 42.8 per cent and 45.9 per cent to the same date in the two years previous.

TABLE 54.—COTTON SEED CRUSHED AND LINTERS OBTAINED TO DECEMBER 1 AND JANUARY 1, BY STATES: CROPS OF 1912, 1913, 1914, AND 1915.

STATE.	COTTON SEED OF CROP INDICATED CRUSHED PRIOR TO—							LINTERS OF CROP INDICATED OBTAINED PRIOR TO—						
	Jan. 1.				Dec. 1.			Jan. 1.				Dec. 1.		
	1915	1914	1913	1912	1915	1914	1913	1915	1914	1913	1912	1915	1914	1913
United States....	Tons. 2,615,352	Tons. 3,338,176	Tons. 3,012,685	Tons. 2,739,897	Tons. 1,956,703	Tons. 2,473,931	Tons. 2,192,276	Bales. 531,369	Bales. 462,073	Bales. 397,974	Bales. 352,972	Bales. 381,347	Bales. 341,142	Bales. 288,468
Alabama.....	200,157	286,226	262,854	235,264	148,894	211,935	192,841	42,485	38,414	32,789	25,966	30,481	28,085	23,863
Arkansas.....	151,306	184,465	175,312	142,533	109,335	132,847	116,632	29,227	25,833	22,667	18,839	20,072	18,121	15,299
Florida.....	( <sup>1</sup> )	23,874	17,578	15,650	( <sup>1</sup> )	19,177	13,806	( <sup>1</sup> )	2,176	1,677	1,154	( <sup>1</sup> )	1,690	1,397
Georgia.....	470,471	581,544	518,137	405,541	350,737	433,046	375,266	97,796	75,063	65,461	48,900	71,837	56,293	46,846
Louisiana.....	89,182	122,343	103,022	94,877	70,003	90,932	74,625	18,094	16,008	13,538	10,324	14,129	11,948	9,503
Mississippi.....	233,584	319,820	284,527	241,987	177,649	228,796	195,700	48,553	44,376	34,620	27,936	35,306	31,014	23,390
Missouri.....	13,564	20,342	19,530	15,568	9,429	13,947	13,749	3,055	2,619	2,381	1,642	2,002	1,800	1,619
North Carolina.....	169,782	186,522	162,995	160,164	118,591	126,458	114,233	29,504	21,371	17,607	14,889	19,861	14,409	11,823
Oklahoma.....	137,738	232,557	188,473	191,936	79,555	164,675	136,191	28,869	37,397	28,885	28,794	15,914	26,213	20,966
South Carolina.....	205,998	257,576	239,439	203,889	158,914	190,315	171,496	37,772	29,887	26,779	20,719	26,742	21,799	19,105
Tennessee.....	128,664	156,382	151,221	107,739	90,710	111,358	100,120	29,477	22,176	19,234	13,432	19,213	15,032	12,658
Texas.....	770,972	921,978	860,321	901,047	604,877	724,870	667,176	156,975	141,970	129,243	138,190	119,459	111,027	99,959
All other states.....	43,934	41,547	32,276	28,702	34,009	25,575	20,391	8,962	4,783	3,093	2,187	6,331	3,111	2,005

<sup>1</sup> Included in "All other states."

COMPARATIVE DATA FOR THE INDUSTRY.

The remarkable development of the cottonseed-products industry in the United States is indicated in Table 55, which shows the estimated quantity of cotton

seed produced, the quantity utilized for manufacturing purposes, and the estimated quantities and values of crude products manufactured, together with statistics regarding the exports of cottonseed and its products for a series of years.



COTTON PRODUCTION AND DISTRIBUTION.

TABLE 55.—ESTIMATED QUANTITY OF COTTON SEED PRODUCED, QUANTITY OF COTTON SEED CRUSHED; ESTIMATED QUANTITIES AND VALUES OF CRUDE PRODUCTS OBTAINED, AND EXPORTS OF COTTONSEED PRODUCTS: 1874 TO 1915.

In the preparation of this table a number of sources of information have been utilized, but it has been found impracticable to secure all in instances satisfactory data for the years indicated, and only an approximation to the facts is claimed. Statistics of the quantity of seed produced and the quantity crushed and of cottonseed products relate to the growth year, while the statistics of exports are for the year ending June 30, following.]

Table with columns for Year, Cotton Seed (Produced, Crushed, Total Value), Crude Cottonseed Products (Oil, Cake and meal, Hulls, Linters), and Exports (Cottonseed products: Oil, Cake and meal).

The figures of the Thirteenth Census are not shown in this table because they do not represent a single growth year.

FERTILIZERS.

Cotton growers and farmers generally are coming to realize more and more the value of fertilizers in increasing the yield of their crops. This is especially the case with the cotton crop, and the use of commercial fertilizers is increasing, particularly in the eastern section of the cotton belt. Among the most important ingredients in fertilizers are ammoniates, of which cottonseed meal is one of the best. It is largely on this account that the oil mills have taken up the mixing and manufacture of fertilizers. For the season of 1913-14, 179 oil mills reported the manufacture of 402,417 tons of commercial fertilizers, valued at \$8,630,355. These establishments were located in 10 states, distributed as follows: In

Alabama, 23; Arkansas, 8; Florida, 1; Georgia, 62; Louisiana, 6; Mississippi, 9; North Carolina, 26; South Carolina, 30; Tennessee, 1; and Texas, 13. These establishments do not represent all those which use cottonseed-oil meal in this manufacture. Large quantities of meal are also consumed by establishments primarily engaged in the manufacture of fertilizers, these, in many instances, being controlled by the same interests which operate the oil mills. In addition to the quantity of meal used in the manufacture of fertilizers by oil mills and fertilizer factories, large amounts are sold as such for use as fertilizer. However, it is probable that meal unmixed with other materials is not now being used for this purpose to so great an extent as in earlier years.



COTTON PRODUCTION AND DISTRIBUTION.

TABLE 57.—NUMBER OF GINNERS IN 1915 AND QUANTITY OF COTTON, EXCLUSIVE OF LINTERS, GINNED FROM THE CROPS OF 1911 TO 1915, BY COUNTIES—Continued.

Main table for Alabama showing ginneries, quantity ginned (1915-1911), and bales ginned (1915-1911) for various counties.

ARKANSAS.

[See map on page 92.]

Main table for Arkansas showing ginneries, quantity ginned (1915-1911), and bales ginned (1915-1911) for various counties.







COTTON PRODUCTION AND DISTRIBUTION.

TABLE 57.—NUMBER OF GINNERIES IN 1915 AND QUANTITY OF COTTON, EXCLUSIVE OF LINTERS, GINNED FROM THE CROPS OF 1911 TO 1915, BY COUNTIES—Continued.

Table with columns for County, Gineries (Active/Idle), Total Quantity Ginned (Number of bales and equivalent 500-pound bales), and Number of Bales Ginned to Dec. 13 (Counting round as half bales).

LOUISIANA—Continued.

MISSISSIPPI.

[See map on page 96.]

Table with columns for The state, 2,204, 534, 925,509, 1,217,883, 1,251,841, 1,004,376, 1,169,066, 953,965, 1,245,535, 1,310,743, 1,046,418, 1,203,645, 862,201, 1,082,816, 1,084,680, 883,458, 996,601. Lists counties and their corresponding cotton ginning statistics.

1 Included in "All other counties," to avoid disclosure of individual operations.

2 Walthall County organized from parts of Marion and Pike.





COTTON PRODUCTION AND DISTRIBUTION.

TABLE 57.—NUMBER OF GINNERIES IN 1915 AND QUANTITY OF COTTON, EXCLUSIVE OF LINTERS, GINNED FROM THE CROPS OF 1911 TO 1915, BY COUNTIES—Continued.

Main table for North Carolina showing number of ginneries and quantity of cotton ginned by county from 1915 to 1911. Columns include County, Ginneries (Active/Idle), and Quantity Ginned (Number of bales and Number of equivalent 500-pound bales).

NORTH CAROLINA—Continued.

OKLAHOMA.

[See map on page 97.]

Main table for Oklahoma showing number of ginneries and quantity of cotton ginned by county from 1915 to 1911. Columns include County, Ginneries (Active/Idle), and Quantity Ginned (Number of bales and Number of equivalent 500-pound bales).

1 Included in "All other counties," to avoid disclosure of individual operations.

2 Cotton County organized from part of Comanche.

COTTON GINNED, BY COUNTIES.

TABLE 57.—NUMBER OF GINNERIES IN 1915 AND QUANTITY OF COTTON, EXCLUSIVE OF LINTERS, GINNED FROM THE CROPS OF 1911 TO 1915, BY COUNTIES—Continued.

Table with columns for County, Gineries (Active, Idle), Total Quantity Ginned (Number of bales, Number of equivalent 500-pound bales), and Number of Bales Ginned to Dec. 13 (Counting round as half bales). Rows include counties like Love, McClain, Murray, etc., under the heading OKLAHOMA—Continued.

SOUTH CAROLINA.

[See map on page 98.]

Table listing cotton ginning statistics for South Carolina by county. Columns include county names, gineries (Active, Idle), total quantity ginned (bales and equivalent 500-pound bales), and bales ginned to Dec. 13. Counties listed include Abbeville, Aiken, Anderson, etc.

1 Included in "All other counties," to avoid disclosure of individual operations.

2 Jasper County organized from parts of Beaufort and Hampton.





COTTON PRODUCTION AND DISTRIBUTION.

TABLE 57.—NUMBER OF GINNERIES IN 1915 AND QUANTITY OF COTTON, EXCLUSIVE OF LINTERS, GINNED FROM THE CROPS OF 1911 TO 1915, BY COUNTIES—Continued.

Table with columns for County, Gineries (Active/Idle), Total Quantity Ginned (Number of bales, Number of equivalent 500-pound bales), and Number of Bales Ginned to Dec. 31 (1915-1911). Includes sections for TEXAS and VIRGINIA.

1 Kleberg County organized from part of Nueces.

2 Included in "All other counties," to avoid disclosure of individual operations.

















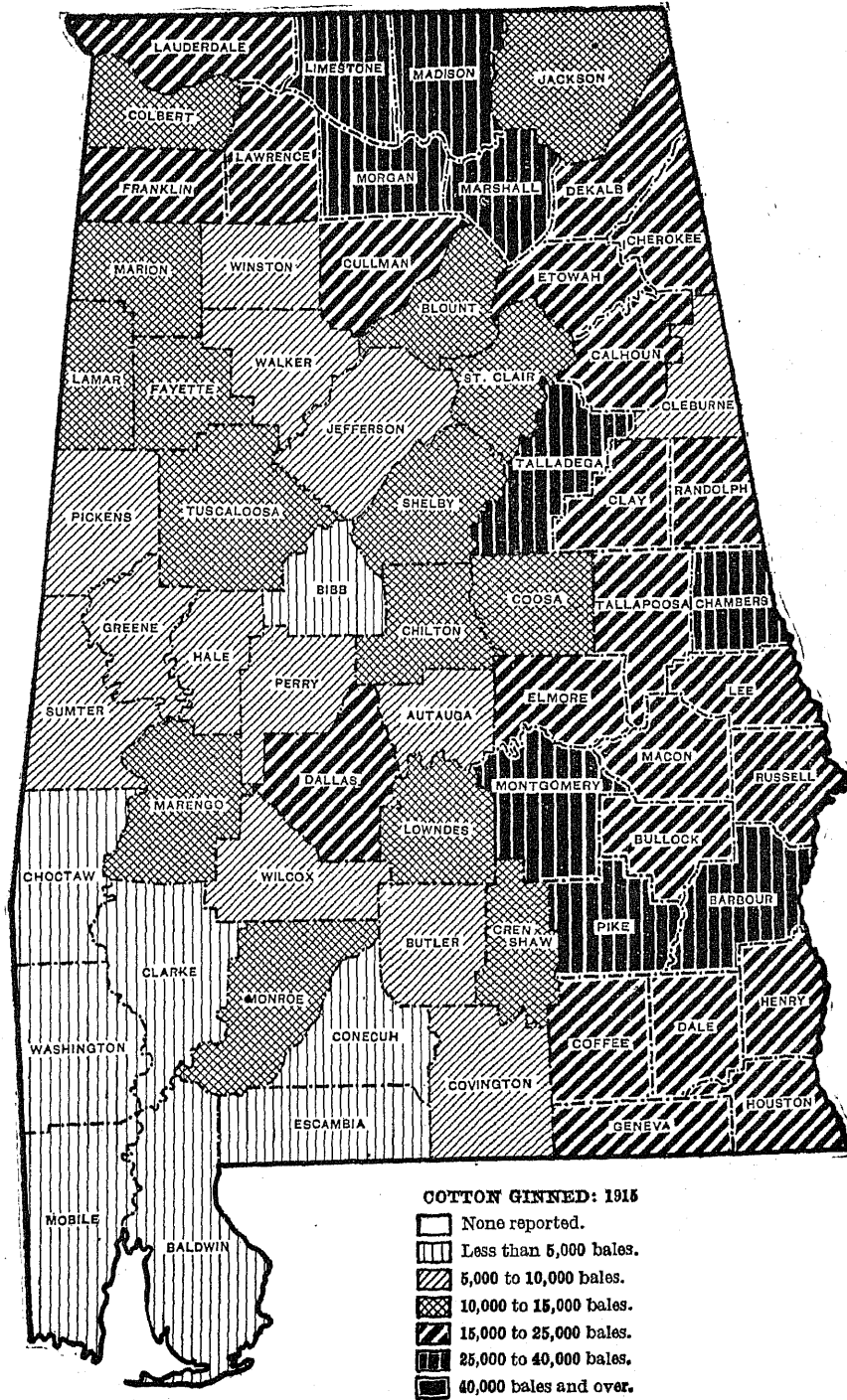






# ALABAMA.

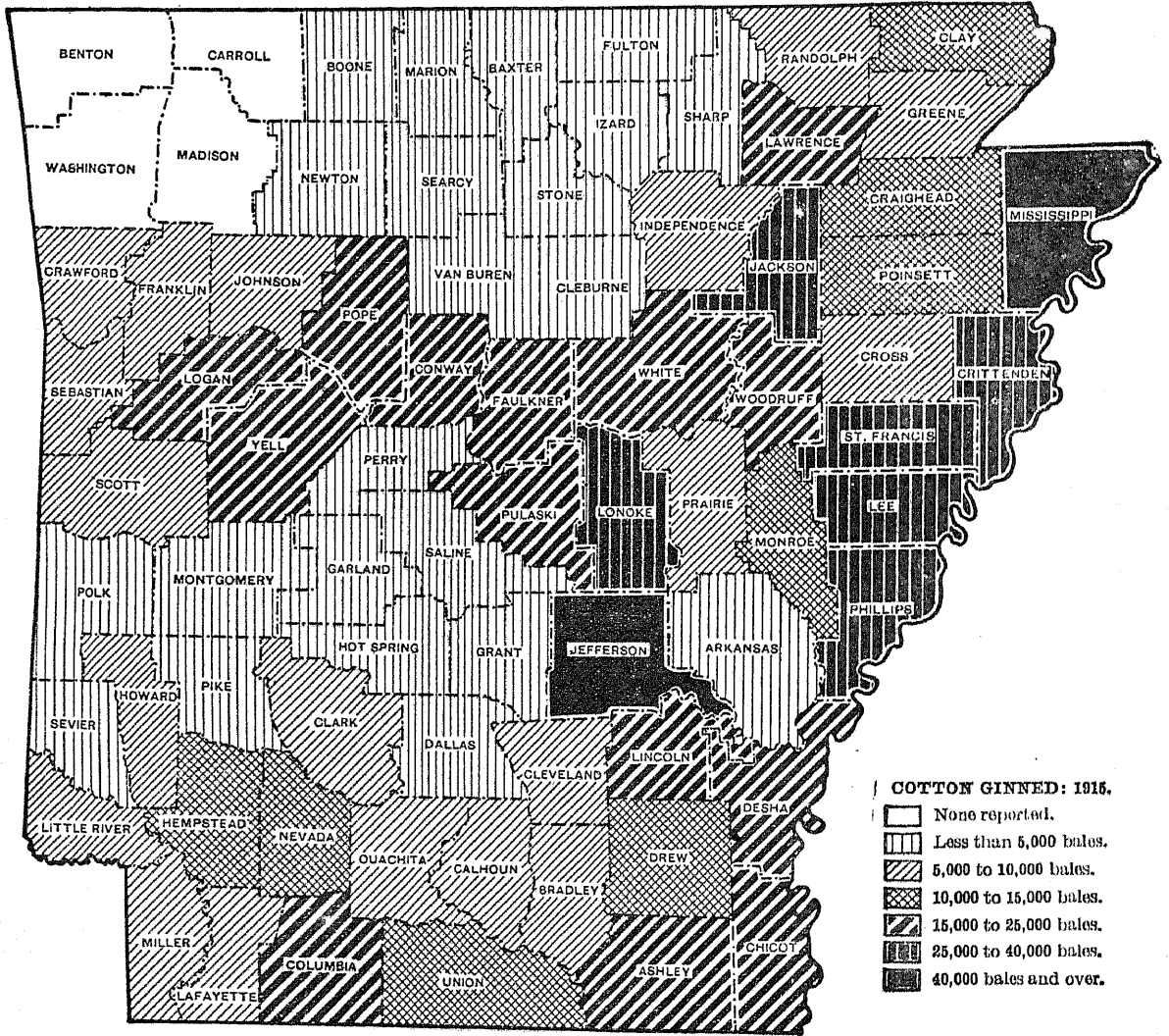
[See table on page 69.]





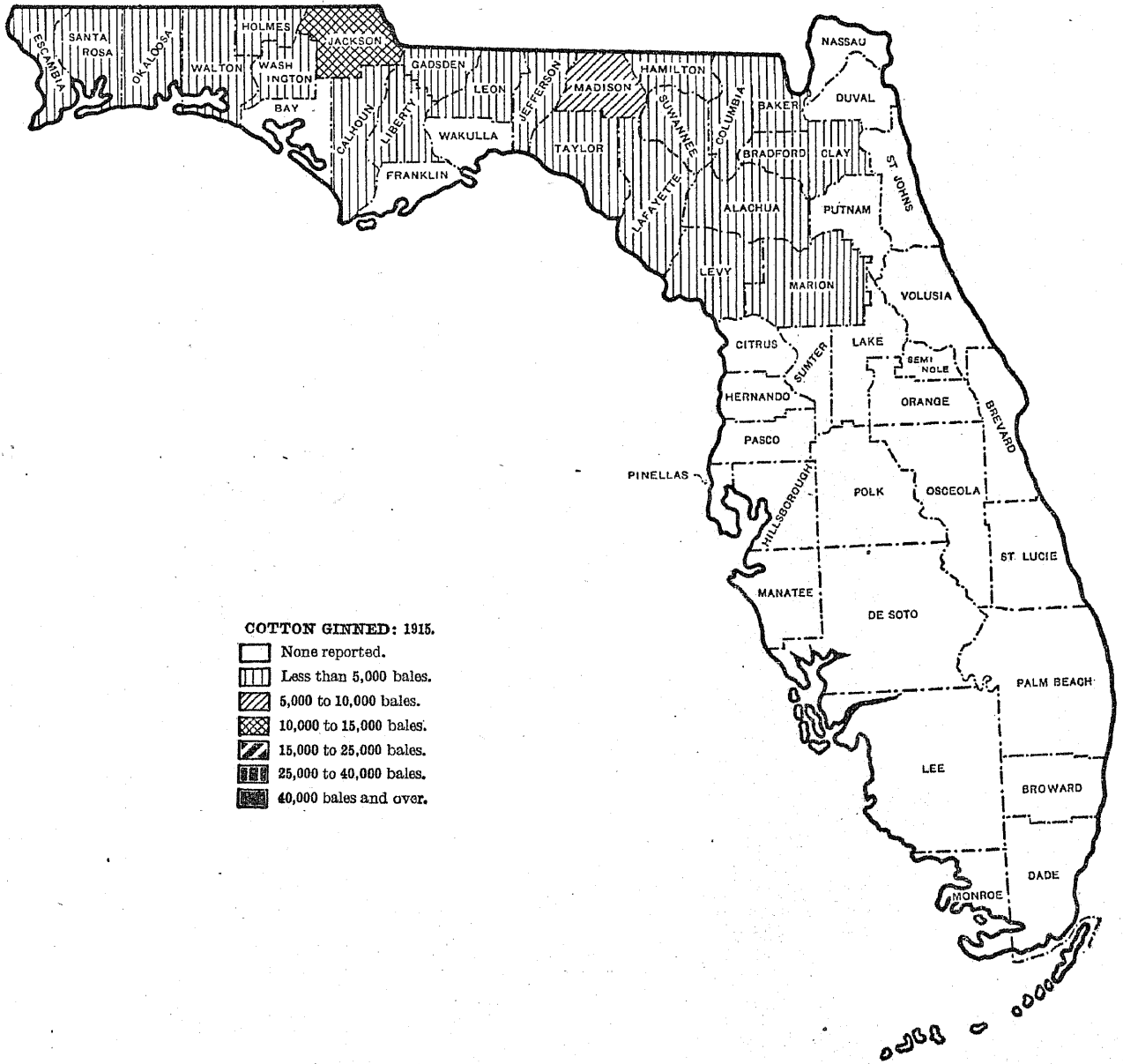
# ARKANSAS.

[See table on page 70.]



# FLORIDA.

[See table on page 71.]

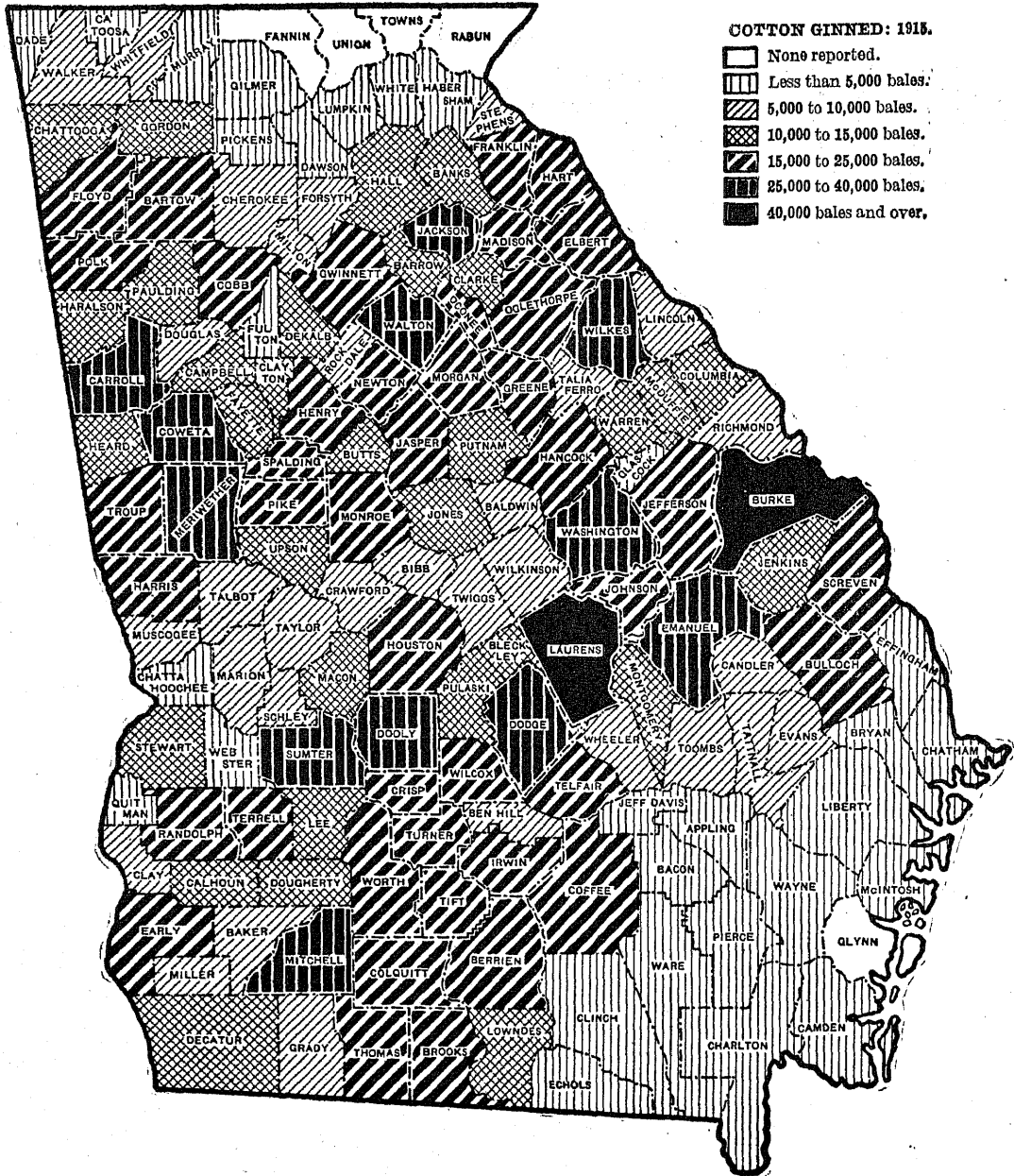


**COTTON GINNED: 1915.**

- None reported.
- Less than 5,000 bales.
- 5,000 to 10,000 bales.
- 10,000 to 15,000 bales.
- 15,000 to 25,000 bales.
- 25,000 to 40,000 bales.
- 40,000 bales and over.

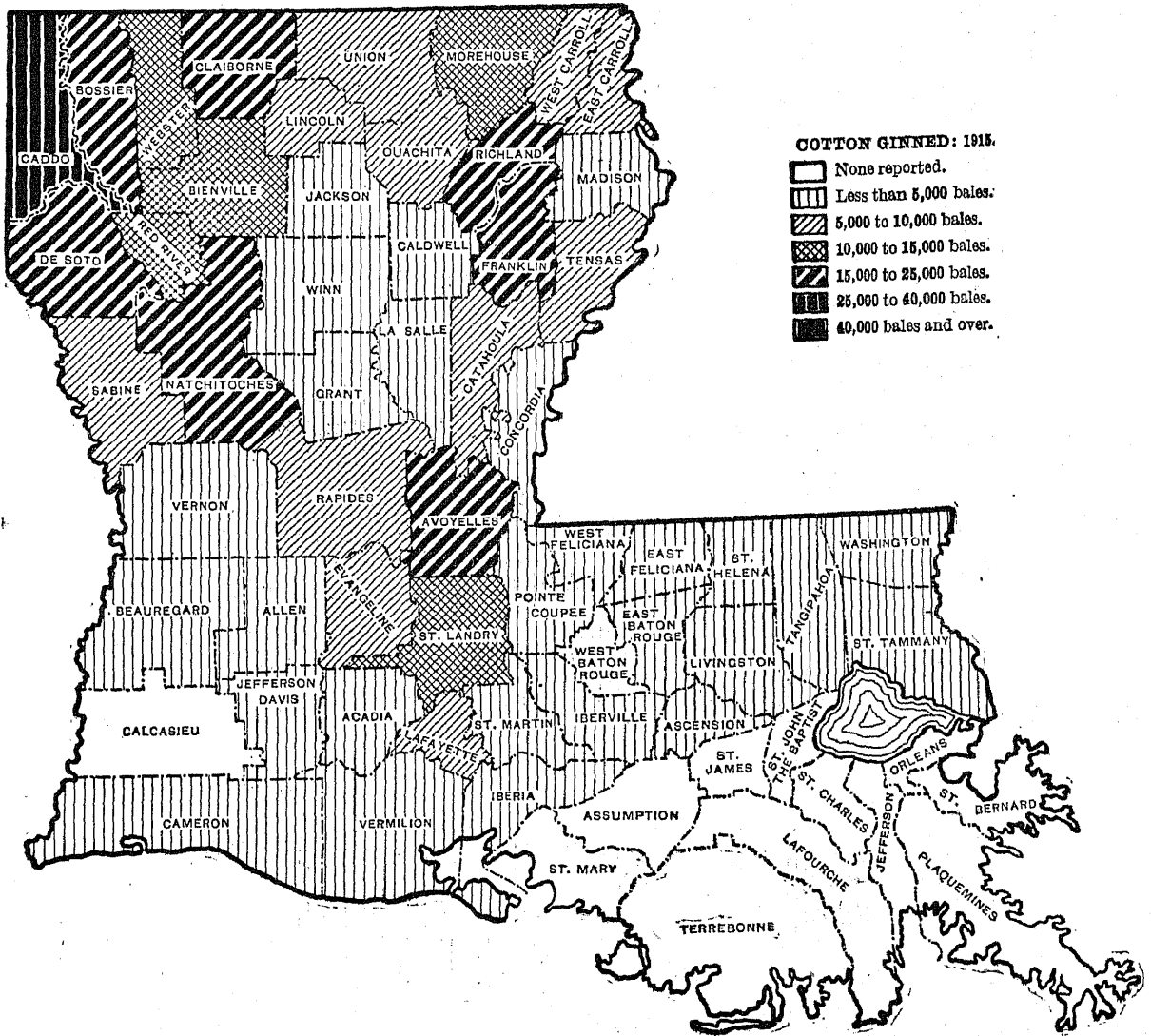
# GEORGIA.

[See table on page 71.]



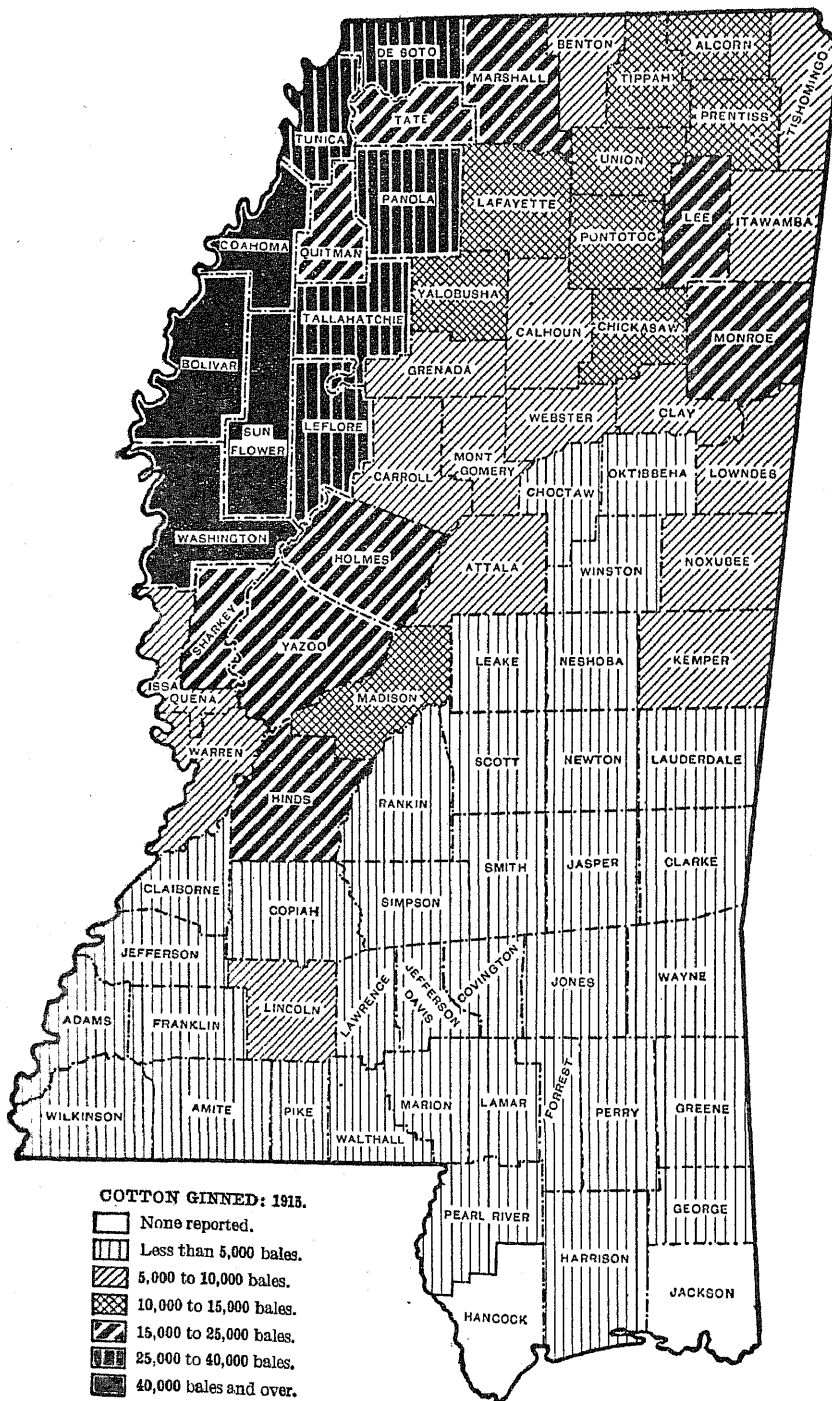
# LOUISIANA.

[See table on page 73.]



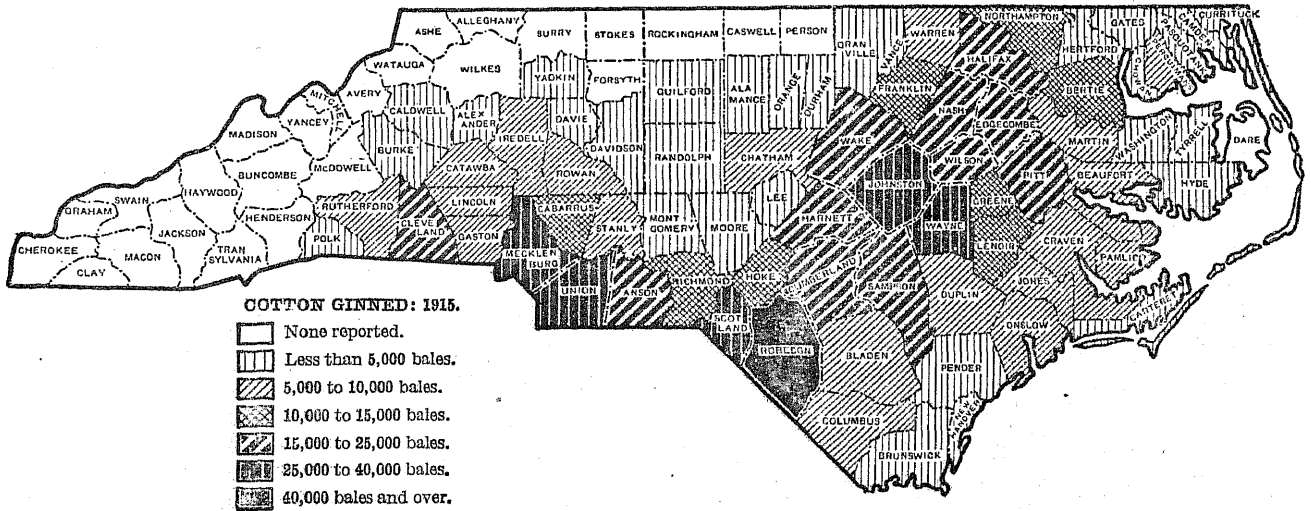
# MISSISSIPPI.

[See table on page 74.]



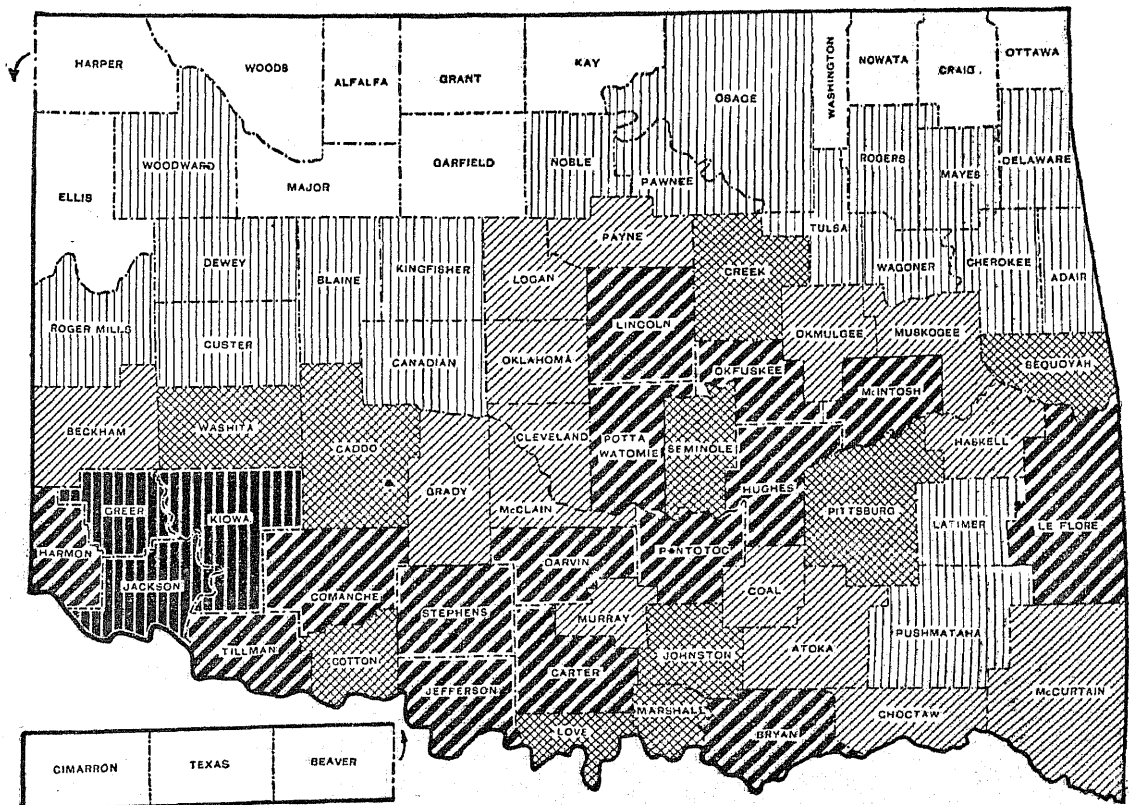
# NORTH CAROLINA.

[See table on page 76.]



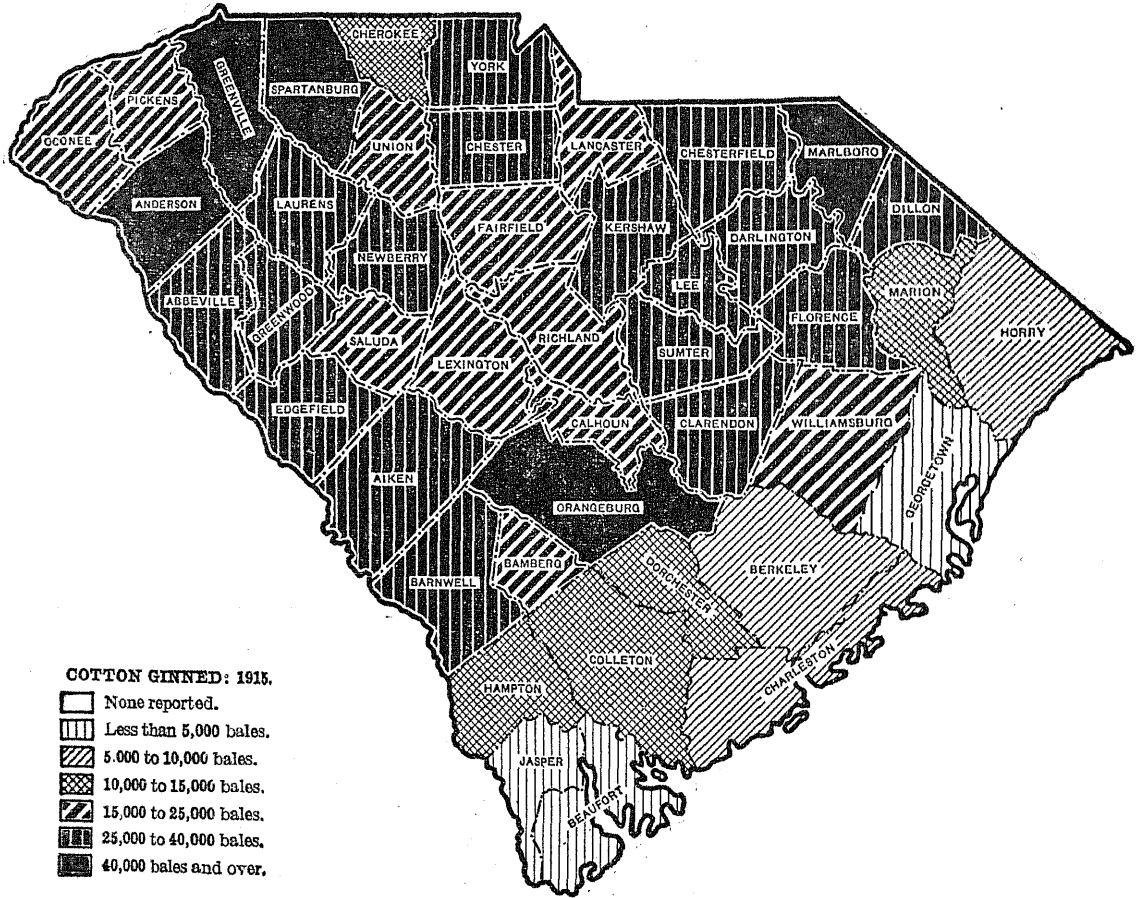
# OKLAHOMA.

[See table on page 76.]



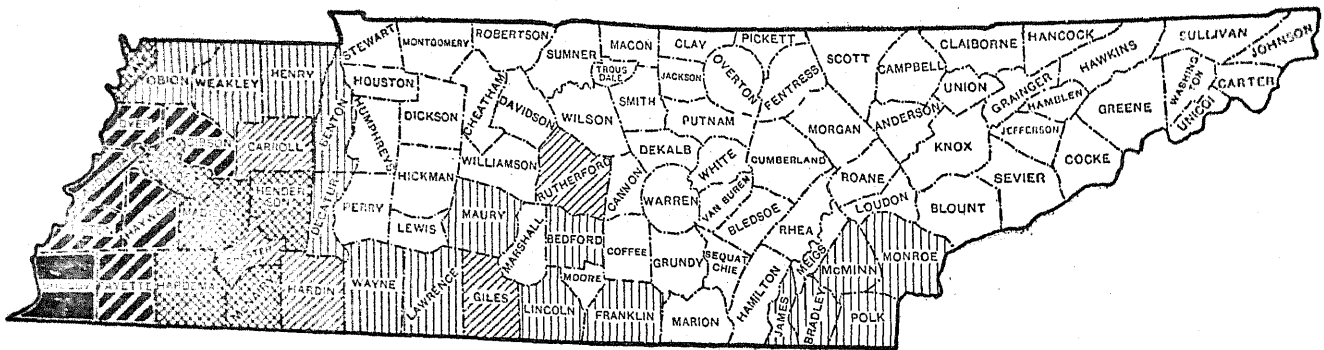
# SOUTH CAROLINA.

[See table on page 77.]



# TENNESSEE.

[See table on page 78.]



# TEXAS.

[See table on page 78.]

