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BUREAU OF THE CENSUS

S. N. D. NORTH, DIRECTOR

BULLETIN 97

SUPPLY AND DISTRIBUTION
OF COTTON

FOR THE YEAR ENDING AUGUST 31, 1908



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LETTER OF TRANSMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF THE CENSUS,
Washington, D. C., November 9, 1908.

SIR:

I have the honor to transmit herewith Census Bulletin 97, containing a report on the supply and distribution of cotton in the United States for the year ending August 31, 1908. The statistics were collected and compiled under the supervision of Mr. William M. Steuart, chief statistician for manufactures, assisted by Mr. Daniel C. Roper, expert chief of division.

This report was authorized by a joint resolution of Congress, approved February 9, 1905, and forms the complement to the report on production, compiled from the returns of ginneries. The present report is the fourth of the series, and completes the inquiries relative to the cotton crop of 1907. The report is presented in three divisions: (1) The supply of cotton in the United States for the year ending August 31, 1908, and the distribution of the same, including statistics of imports and exports, spindles, cotton consumed, and stocks distributed according to actual holders; (2) the latest available data regarding the industry in foreign countries; (3) historical and descriptive matter relating to cotton manufacturing in the United States, with illustrations. Information is also presented in regard to the utilization of cotton waste, available waterpower in the United States, and as to the grading and classifying of cotton.

Very respectfully,



Director.

HON. OSCAR S. STRAUS,
Secretary of Commerce and Labor.

SUPPLY AND DISTRIBUTION OF COTTON.

(FOR THE YEAR ENDING AUGUST 31, 1908.)

By DANIEL C. ROPER.

GENERAL SUMMARY.

The following summary shows, under certain general headings, the supply of cotton in the United States for the past year and the distribution of this supply. Detailed figures are presented elsewhere in the report.

TABLE 1.—SUPPLY AND DISTRIBUTION OF COTTON IN THE UNITED STATES, FOR THE YEAR ENDING AUGUST 31, 1908.

SUPPLY.		Running bales. ¹
Total		13, 358, 707
Stocks held September 1, 1907		1, 514, 567
By manufacturers in cotton growing states		311, 307
By manufacturers in all other states		705, 431
By transportation companies		54, 596
In warehouses and compresses		388, 919
By merchants, buyers, cottonseed-oil mills, and ginners		40, 088
By producers		14, 226
Cotton grown in 1907 returned as ginned after August 31, 1907		11, 125, 604
Cotton grown in 1908 returned as ginned before September 1, 1908		402, 229
Net imports, year ending August 31, 1908		140, 869
To balance distribution		175, 488
DISTRIBUTION.		
Total		13, 358, 707
Cotton consumed		4, 539, 090
By manufacturers in cotton growing states		2, 187, 096
By manufacturers in all other states		2, 351, 994
Cotton destroyed by fire		10, 210
Cotton exported		7, 573, 349
Stocks held August 31, 1908		1, 236, 058
By manufacturers in cotton growing states		112, 471
By manufacturers in all other states		481, 713
By transportation companies		72, 186
In warehouses and compresses		444, 626
By merchants, buyers, cottonseed-oil mills, and ginners		72, 223
By producers		52, 839

¹ Statistics of foreign cotton have been reduced to equivalent 500-pound bales.

SUPPLY.

According to the statistics of Table 1, the supply of cotton in the United States for the year ending August 31, 1908, was 13,358,707 running bales, as compared with 15,025,720 bales for 1907 and 13,055,260 for 1906. This marked loss of 1,667,013 bales, as compared with 1907, is mainly due to the large falling off in the crop of 1907, which was nearly 2,000,000 bales less than that of the previous year, although there was also a decrease in the quantity of cotton imported. The consumption of cotton in this country in 1908 was 445,846 bales less than in the preceding year, and the exports 929,916 bales less. The stocks of cotton in the country on August 31, 1908, amounted to 1,236,058 bales, compared with 1,514,567 bales on the corresponding date last year. Stocks held by manufacturers in the cotton growing states show a decrease from 311,307 bales to 112,471 bales, and in all other states from 705,431 to 481,713 bales. The stocks in warehouses and compresses, and in general outside of the hands of manufacturers, show a large relative increase, amounting in the aggregate to somewhat less than 150,000 bales, due almost entirely to the earlier maturity of the crop this season and the consequent increase in the amount ginned prior to September 1.

The data for the several items in the table showing the distribution of the cotton supply for the year just ended have been carefully collected. The statistics as to stocks have been secured through careful inquiries made by the local agents at the time of making the canvass for cotton ginned to September 1, but, owing to the impracticability of making a house-to-house canvass, stocks in the possession of merchants, buyers, and growers include some estimates made by the canvassing agents. In order to avoid duplication, stocks at ports, generally known as "port stocks," have been distributed in this report according to the classes of holders named in the table.

It will be observed that the statistics as to the supply of cotton presented in Table 1 fail, by 175,438 bales, to balance with those presented for its distribution. As there are so many agencies and holders to be canvassed in the compilation of the statistics on the supply and distribution of cotton, and as numerous factors exist which tend to create discrepancies, it is indeed remarkable that the balance sheet should show so small a difference. Among the factors responsible for this condition may be named the following: (1) The inclusion of rebaled samples, commonly called "city crop;" (2) the lack of uniformity on the part of manufacturers in returning stocks, since, notwithstanding the endeavors made to impress all holders of cotton with the necessity of returning stocks in accordance with Census schedules, slight duplications may result from manufacturers

reporting in their stocks cotton held for them in independent warehouses, which may also be returned by the managers of these places of storage; and (3) an understatement by ginners and delinters of the quantity of cotton produced, due largely to the inability of these agencies to estimate accurately the quantity of cotton remaining to be ginned and the quantity of linters to be saved from reginning cottonseed at the time of the March canvass for production.

It is impossible to state, with any degree of assurance, how much any one or all of these factors contribute to the discrepancy. The amount of error to be charged to each will no doubt vary in different seasons, but a considerable part of the discrepancy between the figures for supply and those for distribution will always be attributable to the first cause. Between the time a bale of cotton leaves the ginnery and the time when it reaches the consumer it is "sampled" a number of times, that is, a small quantity of the fiber is extracted from the bale for use in determining its value, and these samples, with cotton otherwise lost from the original packages, are rebaled and counted in the statistics of exports, consumption, and stocks. A system using for its basis of supply an enumeration at the ginneries, before any samples have been removed, does not include this cotton and its inclusion in the statistics of distribution is a source of duplication. The amount of this rebaled cotton will vary in different seasons from 100,000 to 200,000 bales, depending upon the size of the crop, as well as on other conditions. The discrepancy resulting from this and other causes, amounting to only 1.3 per cent of the total distribution in 1908, is shown in the table under the heading "to balance distribution." This indicates a remarkably close approximation to the facts and is about 200,000 bales less than the discrepancy shown in the report for 1907. This gratifying result has been made possible by the cooperation of producers, ginners, manufacturers, and others.

The plan of collecting reports of cotton production through the ginners not only results in reliable statistics, if full returns are secured, but enables a segregation with regard to the year of growth and the locality where grown not possible under other systems; furthermore, the reports of production collected in this way, showing the crop of the preceding year, are issued as early as April 1, a saving in time of some five months over the commercial system, through which full reports can not be secured until after August 31, the close of the commercial year. Again, by obtaining full reports of cotton ginned to specified dates during the season, it is possible to make comparisons of the statistics of one year with those for the same date in previous years and thus to judge of the volume of successive crops with a degree of accuracy not otherwise possible. The report on cotton production,

compiled from the returns of ginners, and its complement, that on the supply and distribution of cotton, become mutual checks on each other. The segregation of stocks at the end of the year, made possible under the Census system, is unique and desirable, as it shows the quantity of cotton in the possession of each general class of holders and furnishes trustworthy information as to the present available supply.

Imports.—The imports of raw cotton, by countries, for selected years from 1890 to 1908 are shown in the following table:

TABLE 2.—Imports of raw cotton, by countries from which imported, for selected years: 1890 to 1908.¹

[500-pound bales.]

COUNTRY.	1908	1907	1906	1900	1895	1890
Total.....	143,490	228,793	133,405	134,797	98,664	217,212
Egypt.....	122,170	168,122	105,697	107,109	59,864	5,896
United Kingdom.....	10,379	19,726	17,754	20,957	35,478	10,124
Peru.....	5,917	7,619	6,397	5,575	2,394	603
Other countries.....	5,024	33,326	3,557	1,156	928	589

¹ The statistics in this table are for the years ending August 31, with the exception of those for 1890, 1895, and 1900, which are for the years ending June 30.

² Includes cotton waste.

The quantity of cotton imported into the United States during the year ending August 31, 1908, was 71,744,992 pounds, of which 1,310,229 pounds were reexported, thus making the net imports 70,434,763 pounds, equivalent to 140,870 bales of 500 pounds each. This is a decrease of 61,863 bales, or 30 per cent, compared with 1907, when the net imports amounted to 202,733 bales.

Practically all of the cotton imported is Egyptian. Great Britain usually takes more than one-half of the Egyptian production, Austria about 10 per cent, America about 8 per cent, France about 7 per cent, and Italy and Russia each about 6 per cent.

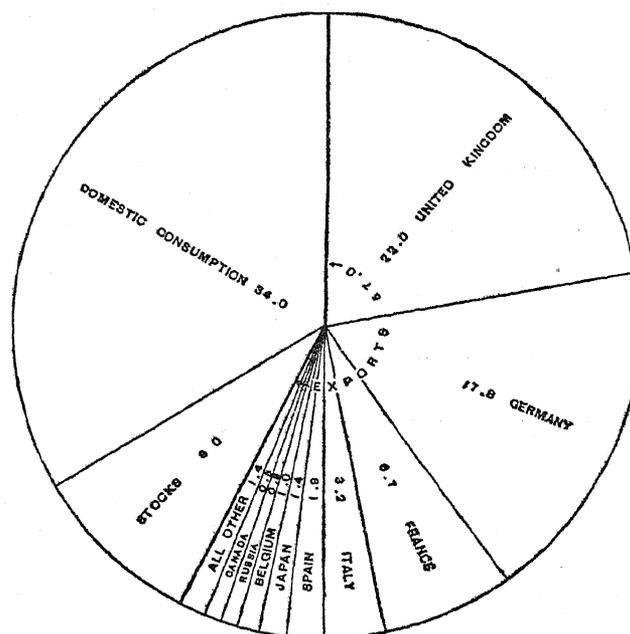
DISTRIBUTION.

Of the total cotton supply of this country for 1908, shown in Table 1, 4,549,300 bales, or 34 per cent, including that destroyed by fire, were consumed in this country; 7,573,349 bales, or 57 per cent, were

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exported; while 1,236,058 bales, or 9 per cent, remained in the country at the close of the year. Of the supply for the preceding year 33 per cent was consumed at home, 57 per cent exported, and 10 per cent remained in the country at the close of the year. The slight variation shown in the different proportions for the two years is interesting when it is remembered that the supply for 1908 is more than one and one-half million bales less than that for 1907.

DIAGRAM 1.—Proportion of supply of cotton for 1908 consumed in the United States, held in stocks, and exported, with distribution of exports by countries to which exported.



Cotton manufacturing in the United States.—The statistics of spindles, and of stocks, takings, and consumption of cotton have been collected by special agents and by direct correspondence. In the cotton growing states the agents were those appointed to collect the statistics of cotton ginned, while in the concentrated mill centers in other states agents were detailed from the Bureau for this work. The results of this canvass, relating to cotton consuming establishments, are presented in Table 3.

TABLE 3.—NUMBER OF COTTON CONSUMING ESTABLISHMENTS, NUMBER OF SPINDLES, QUANTITY OF COTTON CONSUMED, AND STOCKS HELD BY MANUFACTURERS AT THE CLOSE OF THE YEAR, BY STATES: 1908, 1907, AND 1906.

STATE.	Year.	Number of establishments.	COTTON SPINDLES.		Spindles consuming cotton mixed with other fibers (number). ¹	COTTON CONSUMED.			STOCKS HELD BY MANUFACTURERS.		
			Total (number).	Active (number).		Running bales (number). ²	Equivalent 500-pound bales.			Total (running bales). ³	Foreign (500-pound bales)
							Total.	Domestic.	Foreign.		
United States.....	1908	1,941	27,964,387	27,505,422	593,682	4,539,090	4,493,028	4,343,400	149,628	504,184	62,803
	1907	1,830	26,939,415	26,375,181	561,251	4,984,936	4,974,199	4,833,831	140,368	1,016,738	79,520
	1906	1,732	25,811,681	25,250,096	.....	4,909,279	4,877,465	4,738,990	138,475	680,471	40,118
Alabama.....	1908	71	939,942	934,642	.....	202,177	201,965	201,536	429	11,302	289
	1907	74	904,244	876,944	.....	239,149	239,479	238,901	578	20,946	218
	1906	68	870,154	851,986	.....	244,058	243,224	242,462	762	21,619	195
Arkansas.....	1908	10	14,324	13,700	.....	4,124	4,143	4,143	.....	591	.....
	1907	7	14,324	12,972	.....	4,411	4,402	4,402	.....	825	.....
	1906	11	17,324	13,180	.....	3,946	3,913	3,913	.....	474	.....
California.....	1908	22	15,500	15,500	4,400	12,602	12,940	12,940	.....	2,432	.....
	1907	15	12,284	12,284	.....	15,937	16,411	16,403	8	3,590	.....
	1906	(*)	11,000	11,000	.....	13,120	13,396	13,396	.....	1,308	.....
Connecticut.....	1908	85	1,240,296	1,236,906	45,154	128,791	128,798	111,687	17,111	35,654	4,097
	1907	86	1,222,239	1,215,435	52,630	147,450	148,632	132,247	16,385	49,060	9,844
	1906	86	1,181,913	1,174,527	.....	148,692	148,877	135,211	13,666	38,107	3,100
Georgia.....	1908	154	1,792,790	1,757,686	13,876	474,986	458,475	450,379	2,096	19,732	422
	1907	149	1,682,506	1,610,004	14,000	521,777	505,078	502,549	2,529	62,400	821
	1906	138	1,573,450	1,546,998	.....	513,814	497,300	491,411	5,889	38,792	1,452
Illinois.....	1908	48	35,488	35,488	2,774	13,500	13,673	13,671	2	1,209	.....
	1907	37	31,488	31,488	4,646	13,412	13,710	13,687	23	1,575	2
	1906	34	31,488	31,488	.....	12,154	12,092	12,034	58	723	3
Indiana.....	1908	28	137,277	128,568	8,904	27,586	27,883	27,883	.....	1,796	.....
	1907	21	134,068	122,568	11,904	27,754	28,428	28,416	12	4,445	2
	1906	19	134,188	126,688	.....	28,389	29,122	29,082	40	2,524	.....
Kansas.....	1908	14	10,000	10,000	1,000	3,873	3,962	3,962	.....	561	.....
	1907	12	5,000	5,000	2,440	3,004	2,959	2,959	.....	963	.....
Kentucky.....	1908	16	85,700	82,700	14,324	23,566	23,738	23,738	.....	4,196	.....
	1907	16	85,764	82,764	14,164	25,785	26,618	26,618	.....	5,220	.....
	1906	14	85,692	82,692	.....	27,970	28,531	28,531	.....	4,004	.....
Louisiana.....	1908	16	89,552	69,552	.....	13,826	13,804	13,804	.....	538	.....
	1907	14	85,724	68,724	.....	17,050	17,080	17,080	.....	799	.....
	1906	12	95,200	92,700	.....	17,578	17,415	17,415	.....	445	.....
Maine.....	1908	35	978,188	978,188	24,632	149,870	153,887	153,049	838	27,915	417
	1907	35	976,017	968,864	40,853	157,152	163,349	162,441	908	37,616	476
	1906	34	931,576	912,593	.....	163,297	169,064	168,403	661	28,312	176
Maryland.....	1908	17	151,000	148,816	9,000	54,320	53,429	53,429	.....	2,168	.....
	1907	16	153,392	142,384	9,000	64,998	64,202	64,202	.....	4,445	.....
	1906	14	156,396	134,112	.....	60,223	59,982	59,982	.....	3,483	.....
Massachusetts.....	1908	203	9,446,380	9,415,363	63,026	1,146,619	1,155,426	1,070,404	85,022	233,024	34,089
	1907	204	9,158,389	9,097,236	70,462	1,253,856	1,279,393	1,202,514	76,879	367,098	47,729
	1906	210	8,904,725	8,790,793	.....	1,234,182	1,252,879	1,173,626	79,253	255,326	25,957
Michigan.....	1908	15	15,576	15,576	2,280	4,809	4,921	4,921	.....	2,447	.....
	1907	12	15,600	15,600	5,432	4,632	4,736	4,657	79	1,920	6
	1906	(*)	15,000	15,000	.....	3,816	3,916	3,903	13	890	.....
Mississippi.....	1908	28	173,216	171,720	8,345	34,383	34,385	34,385	.....	1,735	.....
	1907	26	173,004	162,696	8,404	37,929	37,475	37,475	.....	3,491	.....
	1906	26	165,188	147,474	.....	40,197	39,958	39,958	.....	2,566	.....
Missouri.....	1908	39	27,776	27,776	5,616	10,669	10,690	10,690	.....	1,415	.....
	1907	39	14,416	14,416	312	9,491	9,721	9,721	.....	1,168	.....
	1906	26	14,016	14,016	.....	7,146	6,887	6,887	.....	534	.....
New Hampshire.....	1908	41	1,320,503	1,318,327	39,302	243,494	247,510	244,752	2,758	54,092	1,442
	1907	44	1,325,135	1,307,357	50,520	277,941	286,122	284,454	1,668	82,966	1,235
	1906	46	1,320,027	1,296,445	.....	283,853	291,349	290,525	824	54,124	175
New Jersey.....	1908	33	447,029	441,733	32,112	44,904	43,926	32,640	11,286	14,418	7,498
	1907	28	435,128	425,791	14,563	48,294	47,036	37,325	9,711	9,217	5,297
	1906	27	435,813	417,679	.....	54,597	52,161	44,009	8,152	10,066	2,840
New York.....	1908	135	928,316	910,604	106,044	171,289	172,651	171,577	1,074	22,094	969
	1907	128	927,796	900,506	110,862	191,884	195,108	193,204	1,904	37,797	251
	1906	112	852,826	802,254	.....	176,739	179,054	176,511	2,543	22,838	388
North Carolina.....	1908	293	2,944,404	2,861,446	8,240	637,401	609,305	607,026	2,279	27,253	45
	1907	278	2,681,386	2,604,444	6,556	710,275	684,361	681,306	3,055	84,542	314
	1906	251	2,396,703	2,341,792	.....	675,332	644,920	642,496	2,424	44,417	423
Ohio.....	1908	39	.....	.....	7,744	24,483	24,953	24,953	.....	13,756	2
	1907	31	.....	.....	19,427	24,533	25,373	25,373	16	8,564	.....
	1906	29	.....	.....	.....	21,682	21,976	21,976	.....	9,353	.....
Oklahoma.....	1908	10	5,712	5,712	.....	3,447	3,481	3,481	.....	299	.....
	1907	8	2,856	2,856	.....	2,238	2,264	2,264	.....	388	.....

¹ Not shown separately for 1906.

² Statistics of foreign cotton have been reduced to equivalent 500-pound bales.

³ Included in "all other states."

TABLE 3.—NUMBER OF COTTON CONSUMING ESTABLISHMENTS, NUMBER OF SPINDLES, QUANTITY OF COTTON CONSUMED, AND STOCKS HELD BY MANUFACTURERS AT THE CLOSE OF THE YEAR, BY STATES: 1908, 1907, AND 1906—Continued.

STATE.	Year.	Number of establishments.	COTTON SPINDLES.		Spindles consuming cotton mixed with other fibers (number). ¹	COTTON CONSUMED.			STOCKS HELD BY MANUFACTURERS.		
			Total (number).	Active (number)		Running bales (number). ²	Equivalent 500-pound bales.			Total (running bales). ²	Foreign (500-pound bales).
							Total.	Domestic.	Foreign.		
Pennsylvania.....	1908	126	268,310	257,929	134,238	78,071	78,542	4,457	11,120	975	
	1907	132	278,737	263,205	137,190	86,825	88,619	6,154	12,933	1,225	
	1906	124	316,235	288,143	.....	86,504	87,434	8,168	10,282	625
Rhode Island.....	1908	77	2,388,105	2,279,957	8,516	215,831	217,917	199,022	54,366	11,808	
	1907	74	2,242,931	2,218,905	12,556	223,035	229,322	211,852	76,250	11,433	
	1906	76	2,173,868	2,130,958	.....	217,118	221,353	207,277	54,019	4,332
South Carolina.....	1908	150	3,713,006	3,617,358	.....	610,734	591,188	588,176	32,783	273
	1907	145	3,609,969	3,502,036	.....	668,883	649,173	640,071	96,487	888
	1906	141	3,367,204	3,345,075	.....	674,588	650,291	646,614	55,642	322
Tennessee.....	1908	51	265,198	249,604	21,754	57,876	57,366	57,365	5,362	.....
	1907	45	253,148	230,358	23,482	62,522	60,103	60,103	10,508	.....
	1906	37	258,794	212,062	.....	58,244	58,490	58,490	7,845	.....
Texas.....	1908	55	106,924	103,428	.....	33,635	34,258	34,258	2,178	.....
	1907	52	109,892	103,992	.....	38,602	39,362	39,362	5,443	.....
	1906	52	101,759	93,687	.....	40,023	41,282	41,282	2,122	.....
Vermont.....	1908	16	107,324	100,592	17,812	10,230	10,351	10,014	712	67	
	1907	15	107,324	106,720	24,032	13,921	14,174	13,726	4,470	78	
	1906	15	107,172	102,264	.....	12,758	13,082	12,859	1,342	122
Virginia.....	1908	30	295,579	295,579	3,923	75,182	72,605	72,605	4,525	.....
	1907	29	272,710	250,758	4,738	68,668	67,787	67,785	9,085	.....
	1906	33	253,206	253,206	.....	68,919	68,997	68,991	8,283	1
Wisconsin.....	1908	19	13,612	13,612	4,040	8,710	8,714	8,683	1,878	.....
	1907	13	13,940	13,940	1,992	9,200	9,338	9,304	1,528	.....
	1906	(*)	13,612	13,612	.....	9,756	9,802	9,772	963	2
All other states.....	1908	65	7,360	7,360	5,728	18,102	18,143	18,142	2,544	.....
	1907	47	6,944	6,944	11,026	14,268	14,375	14,372	1,969	.....
	1906	97	18,152	7,672	.....	10,524	10,738	10,728	2,408	.....

¹ Not shown separately for 1906.

² Statistics of foreign cotton have been reduced to equivalent 500-pound bales.

* Included in "all other states."

Of the 1,941 establishments shown in the table, 1,926 consumed raw cotton during the year ending August 31, 1908, while 15, with 54,312 spindles, were continuously idle throughout the year. There were 828 establishments which were returned as having no cotton spindles, but which consumed 199,640 bales. In some instances where more than one mill in the same locality is under the same management, consolidated returns have been received, and consequently, the number of establishments given in the table is somewhat less than the actual number; also establishments engaged exclusively in weaving and which therefore do not use raw cotton are not included. Statistics for all establishments consuming raw cotton are, however, included in this report, but the increase since 1907 in the number of cotton using establishments is more apparent than real. Most of this increase is due to the careful search which has been made this season for the small concerns using raw cotton, such as those engaged in the manufacture of mattresses. The figures for the quantity of cotton consumed have not, however, been materially increased by the inclusion of the operations of these concerns.

So large a proportion of the cotton produced in the United States is exported that it is essential that the report on the supply and distribution of American cotton should seek to present reliable information rela-

tive to the condition of the textile industry in foreign countries. To meet this requirement, there has been published on pages 26 to 31 the latest available information relative to the number of spindles, the quantity of cotton consumed, and stocks held in the several countries using American cotton.

Spindles.—The total number of cotton spindles in the United States, shown in Table 3, represents only those designed primarily for spinning cotton, and therefore does not include those which consumed a mixture of cotton with other fibers. The number of cotton spindles returned in 1908 was 27,964,387, exceeding the number for 1907 by 1,024,972, or 4 per cent. The increase between 1906 and 1907 in the number of cotton spindles was 1,127,734, or 4.4 per cent. In 1908 there were 458,965 spindles which were returned as having been idle throughout the year and which consumed no cotton whatever. Of these, 54,312 spindles were in plants not operated during the year, and 404,653 in mills which consumed some cotton. The number of idle spindles includes some new spindles which were only in place for operation at the close of the year, but had not yet been brought into service.

Time idle.—Of the 1,098 active establishments with cotton spindles in 1908, there were 1,047 which reported that they operated on short time, the average

time idle during the year being returned as 66 days; in the cotton growing states the average was 74 days; in all other states, 56 days. It therefore appears that the 4,339,450 bales of cotton returned as consumed in mills with cotton spindles represent only nine and one-half months of the maximum activity. If all of the cotton mills had been operated on full time during the year, and at their maximum capacity, it would appear that the consumption in the mills with spindles would have amounted to 5,481,410 bales. If there be added to this quantity the 199,640 bales consumed in establishments not reporting cotton spindles, the total maximum consumption capacity for the country would be estimated at 5,681,050 bales.

In the number of spindles, Massachusetts exceeds every other state, having 9,446,380, or 34 per cent of the total; South Carolina ranks second with 3,713,006, or 13 per cent; and North Carolina third with 2,944,404, or 11 per cent. Rhode Island has fourth place, Georgia fifth, New Hampshire sixth, and Connecticut seventh. No other state reports as many as a million spindles.

In addition to the spindles designed primarily to spin cotton, 593,682 spindles have been returned as consuming cotton mixed with other fibers. The states reporting the largest number of such spindles are naturally those which lead in the manufacture of woolen and knit goods. Of the total number of these spindles reported, 134,238, or 23 per cent, were returned from Pennsylvania; 106,044, or 18 per cent, from New York; 63,926 from Massachusetts; and 45,154 from Connecticut.

Ring and mule spindles.—Owing to the difference in the consumptive capacity of ring and mule spindles and the special work they perform, it is believed that the following table which segregates these spindles for the leading cotton manufacturing states will be of interest. The individual returns made to this Bureau by cotton manufacturers at the census of 1905 and the textile directories have been used in making the segregation for 1908, and while the figures shown for this year may not be absolutely accurate they closely approach the facts. The statistics shown for the other years are as returned by manufacturers and published in Census Bulletin 74.

TABLE 4.—NUMBER OF RING AND MULE SPINDLES, BY STATES, FOR SELECTED YEARS: 1890 TO 1908.¹

STATE.	1908			1905			1900			1890		
	Total.	Ring.	Mule.	Total.	Ring.	Mule.	Total.	Ring.	Mule.	Total.	Ring.	Mule.
United States....	27,964,387	22,455,332	5,509,055	23,155,613	17,983,756	5,221,857	19,008,352	13,444,872	5,563,480	14,188,103	8,824,617	5,363,486
Alabama.....	939,942	931,030	8,912	758,087	751,087	7,000	411,328	403,328	8,000	79,234	69,774	9,460
Connecticut.....	1,240,206	789,860	450,436	1,149,915	702,439	447,476	1,000,574	607,448	393,126	934,155	536,514	397,641
Georgia.....	1,792,790	1,694,768	98,022	1,316,573	1,247,301	69,272	815,545	730,619	84,926	445,452	424,928	20,524
Indiana.....	137,277	121,047	16,230	119,252	101,184	18,068	102,488	86,168	16,320	74,604	58,284	16,320
Kentucky.....	85,700	58,580	27,120	76,192	55,072	21,120	66,633	48,234	18,399	42,942	34,158	8,784
Louisiana.....	89,552	82,252	7,300	59,052	56,552	2,500	55,600	55,600	-----	46,200	46,200	-----
Maine.....	978,188	784,064	214,124	891,246	667,522	223,724	841,521	584,573	256,948	885,762	541,065	344,697
Maryland.....	151,000	151,000	-----	133,672	133,672	-----	154,064	154,064	-----	158,930	153,574	5,356
Massachusetts.....	9,446,380	7,060,977	2,385,403	8,411,249	6,082,189	2,329,060	7,784,687	5,228,371	2,556,316	5,824,518	3,393,799	2,430,719
Mississippi.....	173,216	173,111	105	125,352	125,352	-----	75,122	75,122	-----	57,004	57,004	-----
New Hampshire.....	1,320,503	1,045,283	275,220	1,301,281	1,092,205	269,076	1,243,555	950,390	287,165	1,195,643	831,409	364,234
New Jersey.....	447,029	108,690	338,339	436,764	87,960	348,804	431,730	64,638	367,092	374,442	69,962	304,480
New York.....	928,316	474,154	454,162	704,634	328,132	376,502	720,268	353,132	367,136	606,796	272,586	334,210
North Carolina.....	2,944,404	2,852,540	91,864	1,680,950	1,814,190	66,760	1,133,432	1,098,080	35,352	337,786	306,866	30,920
Pennsylvania.....	268,310	134,268	134,042	266,097	145,756	120,341	306,637	182,190	124,447	439,638	263,951	175,687
Rhode Island.....	2,388,105	1,456,479	931,626	2,049,522	1,199,284	850,238	1,880,622	940,294	940,328	1,924,436	1,112,617	811,869
South Carolina.....	3,713,006	3,700,974	12,032	2,604,092	2,848,980	15,112	1,431,349	1,420,697	10,762	332,784	328,784	4,000
Tennessee.....	255,198	253,448	11,750	153,375	143,375	10,000	123,896	103,116	20,780	97,524	75,936	21,588
Texas.....	106,924	103,708	3,216	68,170	68,170	-----	48,756	48,756	-----	15,000	15,000	-----
Vermont.....	107,324	80,688	26,636	108,028	80,312	27,716	100,028	56,712	43,316	71,591	28,856	42,735
Virginia.....	295,579	289,639	5,940	193,062	189,974	3,088	126,827	124,502	2,325	94,294	81,096	13,198
All other states.....	145,348	128,772	16,576	89,048	73,048	16,000	153,690	122,938	30,752	149,318	122,254	27,064

¹ The figures for 1908 include all cotton spindles; those for the other years, spindles in cotton mills only.

It is evident from the statistics of this table that the tendency in the United States is to employ ring frame spindles rather than mules. Because of the ease and facility with which the former can be operated, manufacturers generally prefer them to mules except when special kinds of yarns are required. Between 1905 and 1908 there was a small increase in the number of mule spindles, but the decrease between 1900 and 1905 amounted to 341,623. On the other hand, there has been a very large increase in the number of frame spindles. Nearly four-fifths of all the mules are in New England cotton mills, and most of

the remainder are in New York and New Jersey. There are some kinds of yarn requiring special qualities which can not be made successfully by ring spinning, and for this reason there will always be a demand for mules, at least until the difficulties met with hitherto can be overcome. There are, however, reasons connected with the question of labor which induce manufacturers to use frames rather than mules wherever it is practicable to do so. As will be observed by reference to the report of the International Federation of Master Cotton Spinners' and Manufacturers' Associations on page 26, the condition in

Europe as to the employment of frames and mules is just the reverse of that found in America. In Great Britain less than one-sixth of the forty-six and one-half million spindles represented in the returns made to the Federation were ring spindles, and in Germany less than half, with varying proportions for the other European countries.

Consumption of cotton.—The statistics of consumption of cotton are for all establishments returned as using raw cotton, and include cotton mills, woolen mills, knitting factories, and those establishments which use raw cotton in the manufacture of mattresses, batting, felts, etc. The quantity consumed during the year amounted to 4,539,090 bales, compared with 4,984,936 bales in 1907 and 4,909,279 bales in 1906. The average weekly consumption of cotton in the United States during the year amounted to 87,290 bales, compared with 95,864 bales for 1907, a decrease of 8,574 bales, or 10 per cent. Conditions were unfavorable for cotton manufacturing in the United States during 1908, as is evidenced by the decreased consumption of raw cotton and the reduced prices for the raw material as compared with the activity and highly remunerative operations of the previous season. At the same time, the effect of the financial disturbance which prevailed during the latter part of the calendar year 1907 was probably less acute in cotton manufacturing than in some other lines of

industry. In many sections of the country, however, material curtailment of production or reduction in wages, or both, have been resorted to this season as a matter of urgent necessity.

Massachusetts is the leading state in the consumption of cotton, with 1,146,619 bales, or 25 per cent of the total for 1908, followed by North Carolina, with 637,401 bales, and South Carolina, with 610,734 bales. This slight difference between the last two states is especially remarkable in view of the fact that South Carolina has nearly 800,000 spindles more than are reported for the mills of North Carolina. This probably results from a tendency in South Carolina to spin the finer counts. It may be stated in this connection that, according to the returns of the manufacturers, the average time which the mills were idle in South Carolina during the year amounted to 54 days, compared with 76 days for those in North Carolina. Georgia ranks fourth in quantity of cotton consumed, with 10 per cent of the total; New Hampshire ranks fifth, Rhode Island sixth, and Alabama seventh. As indicated above, a comparison on the basis of spindles gives some of the states a somewhat different rating.

Segregation of cotton consumed.—The statistics of Table 3 include both domestic and foreign cotton. The following tabular statement shows the importance of the different kinds of cotton used:

Segregation of the statistics of the several kinds of cotton represented in the takings, consumption, and stocks of manufacturers.

DISTRIBUTION.	COTTON.					
	Domestic.		Foreign.			
	Sea-Island.	Other.	Egyptian.	Peruvian.	Indian.	Other.
COTTON GROWING STATES.						
Taken by manufacturers (running bales).....	2,855	1,978,802	4,077	1	594	.....
Consumed:						
Running bales.....	3,155	2,176,125	4,932	1	552	.....
Pounds.....	1,227,802	1,065,053,373	3,652,305	250	255,860	.....
Stocks held by manufacturers:						
August 31, 1908 (running bales).....	440	111,002	604	.....	150	.....
September 1, 1907 (running bales).....	740	308,325	1,459	.....	108	.....
ALL OTHER STATES.						
Taken by manufacturers (running bales).....	45,386	1,957,007	70,393	12,023	5,684	99
Consumed:						
Running bales.....	40,992	2,169,191	88,083	12,000	5,853	90
Pounds.....	13,486,157	1,101,932,473	65,594,385	2,601,500	2,574,856	44,830
Stocks held by manufacturers:						
August 31, 1908 (running bales).....	19,692	400,747	30,393	1,556	2,111	14
September 1, 1907 (running bales).....	14,294	612,981	51,083	1,593	2,290	5

The statistics presented in the above statement indicate that in the cotton growing states the manufacturers rely almost exclusively upon domestic upland cotton for their supply, the quantity of sea-island cotton consumed in 1908 being less than 1,250,000 pounds, or about 1 per cent of the total consumed in those states, while the foreign cotton consumed, which was practically all Egyptian, amounted to only about four-tenths of 1 per cent of the total. The main dependence

in the other states is likewise on domestic upland cotton, although 13,486,157 pounds of sea-island and 70,905,631 pounds of foreign were also used. Of the foreign cotton consumed in the country during the year 69,246,690 pounds were Egyptian; 2,691,810 pounds, Peruvian; and 2,830,416 pounds, Indian.

Uses of Egyptian cotton by American manufacturers.—As Egyptian cotton constitutes so large a part of the foreign cotton consumed in the United States, the

following descriptive extract relative to the uses of Egyptian cotton and of the efforts to grow this fiber in the United States will be of interest:

The variety of Egyptian cotton that is most used by American manufacturers is Mit Afifi, which constitutes at least three-fourths of the total imports. The grade most largely used averages 1½ inches in length and furnishes numbers of yarns up to 70's and 80's. Janovitch, and to a small extent Abbasi, averaging 1½ to 1¾ inches in length of fiber, are used as a substitute for the lower grades of sea-island in manufacturing fine yarns (100's and upward). A small quantity of the inferior Ashmuni variety is also imported.

There are four principal reasons for the extensive use of Egyptian cottons in the United States: (1) They are best adapted to mercerizing and other processes that give a high finish to cloth and cause it to resemble silk; (2) their exceptional clearness (freedom from nap) and luster, as well as their capacity for taking dyes, fit them for mixing with silk and for filling sateen, India linens, and similar goods having a brilliant surface; (3) the brown color of Mit Afifi fiber allows it to be used without dyeing in manufacturing goods, such as Balbriggan underwear and lace curtains, in which the ecru shade is desired; (4) they can be used for the manufacture of sewing thread and other articles which need to be very strong and for which no other type of cotton but sea-island is suitable. Owing to the higher price of the latter, Egyptian cottons can in many cases be advantageously substituted.

Except in cases where the brown-colored fiber is especially desired there seems to be little reason for preferring Egyptian to sea-island cotton, although one manufacturer reports that, within the range of the numbers used, the former furnishes a cleaner and better looking filling than either sea-island or peeler (long-staple upland) cottons. The highest grades of sea-island have longer and finer fiber than any other cotton, and therefore make stronger and finer yarns and thread. For these grades the Egyptian can not be substituted, but in manufacturing various classes of goods the somewhat lower price of Egyptian cottons allows them to be used to advantage in place of the lower grades of sea-island, especially when the supply of the latter is below the normal.

Apart from specific qualities of the fiber, American manufacturers give other reasons for preferring Egyptian cotton. They state that it is usually more carefully ginned, graded, and baled, and is apt to be freer from trash and short fiber, hence giving less waste in carding and combing than either sea-island or long-staple upland cottons. Egyptian cotton is also esteemed for its evenness of staple, the different grades showing little variation in this respect from year to year.

Egyptian cotton culture in the United States.—The Egyptian varieties are apparently best adapted to culture under irrigation in regions where there is practically no rainfall during the growing season. The only part of the United States where these conditions exist and where at the same time the summers are long and hot enough for profitable cotton culture is the extreme Southwest, from western Texas to southern California.

Since this type of cotton will continue to produce bolls and ripen fiber until a hard frost occurs, it is obvious that the largest yields can be obtained in regions where the autumn temperatures are highest. We must therefore conclude that the greatest success with Egyptian cotton is to be expected in southern Arizona and southeastern California—a conclusion that is supported by the experience so far gained. The valleys of the Salt river and of the Colorado river (Yuma valley) in Arizona and the Imperial valley in California have been found to be admirably adapted to the production of this type of cotton.¹

Consumption of cotton distributed according to character of establishment.—The following tabular statement

¹ Bureau of Plant Industry, Department of Agriculture, Bulletin No. 128.

shows the quantity of cotton consumed in 1907 and 1908, distributed approximately according to the different classes of establishments in which it was used:

CLASS OF ESTABLISHMENT.	BALES CONSUMED.	
	1908	1907
Total.....	4,539,090	4,984,936
Mills reporting cotton spindles.....	4,339,450	4,751,748
Woolen mills not reporting cotton spindles.....	23,205	40,538
Knitting establishments not reporting cotton spindles.....	18,682	23,859
Bedding and mattress manufacturing establishments.....	98,381	96,155
All other establishments.....	59,372	72,646

The quantity of cotton consumed during 1908 in mills reporting spindles designed to spin cotton exclusively was 4,339,450 bales, compared with 4,751,748 in 1907. This indicates a consumption of about 80 pounds per active cotton spindle in 1908 and 90 pounds in 1907. This result, however, can not be accepted as representing the real capacity of the cotton spindles in the United States, as, in some cases, all or a portion of the spindles are operated only a part of the year, a condition quite prevalent this season, while, on the other hand, the spindles were, in a few instances, operated day and night.

A short fiber called linters, obtained by cottonseed-oil mills from reginning cottonseed before extracting oil, is included in the statistics of consumption and stocks as well as in the exports of raw cotton. The quantity of linters saved during the season of 1907-8, as reported to this Bureau by delinters, amounted to 268,282 bales of 500 pounds each. This cotton is largely used in the manufacture of mattresses, batting, cheap yarns, rope, twine, felt hats, and weather strips, in mixing with shoddy, and for upholstering purposes. Practically all of this linter cotton consumed in the United States in 1908 is included in the last two classifications of the above statement.

Growth of the industry.—To illustrate the growth of the cotton manufacturing industry in the several sections of the country, the following table, covering a series of years, has been prepared:

TABLE 5.—Production and consumption of cotton and number of active cotton spindles in the United States for selected years: 1840 to 1908.

YEAR.	Section.	Production (bales).	Consumption (bales).	Active spindles (number).
1908	United States.....	11,325,832	4,539,090	27,505,423
	Cotton growing states.....	11,325,832	2,187,096	10,200,903
	New England states.....	.....	1,894,835	15,329,333
	All other states.....	.....	457,159	1,975,189
1907	United States.....	13,305,265	4,984,936	26,375,191
	Cotton growing states.....	13,305,265	2,410,993	9,527,964
	New England states.....	.....	2,073,355	14,912,517
	All other states.....	.....	500,588	1,934,710
1906	United States.....	10,725,602	4,900,279	25,250,096
	Cotton growing states.....	10,725,602	2,373,577	8,994,868
	New England states.....	.....	2,059,900	14,407,580
	All other states.....	.....	476,802	1,847,648

TABLE 5.—Production and consumption of cotton and number of active cotton spindles in the United States for selected years: 1840 to 1908—Continued.

YEAR.	Section.	Production (bales).	Consumption (bales).	Active spindles (number).
1905	United States.....	13,697,310	14,278,980	23,687,495
	Cotton growing states.....	13,697,310	12,140,151	7,631,331
	New England states.....		1,753,282	14,202,971
	All other states.....		385,547	1,853,193
1900	United States.....	9,507,786	3,873,165	19,472,232
	Cotton growing states.....	9,507,786	1,523,168	4,367,688
	New England states.....		1,909,498	13,171,877
	All other states.....		440,499	1,933,167
1890	United States.....	7,472,511	2,518,409	14,384,180
	Cotton growing states.....	7,472,511	538,895	1,570,288
	New England states.....		1,502,177	10,934,297
	All other states.....		477,337	1,879,595
1880	United States.....	5,755,359	2,157,034	10,653,435
	Cotton growing states.....	5,755,359	2,188,748	2,501,360
	New England states.....		1,120,498	8,632,087
	All other states.....		252,098	1,459,988
1870	United States.....	3,011,996	796,616	7,132,415
	Cotton growing states.....	3,011,996	68,702	327,871
	New England states.....		551,250	5,498,308
	All other states.....		176,664	1,306,236
1860	United States.....	5,387,052	845,410	5,235,727
	Cotton growing states.....	5,387,052	93,553	324,052
	New England states.....		567,403	3,858,962
	All other states.....		184,454	1,052,713
1850	United States.....	2,409,093	575,506	3,998,022
	Cotton growing states.....	2,409,093	78,140	264,571
	New England states.....		430,603	2,958,536
	All other states.....		66,763	774,915
1840	United States.....	2,063,915	236,525	2,284,631
	Cotton growing states.....	2,063,915	71,000	180,927
	New England states.....		158,708	1,697,394
	All other states.....		6,817	506,310

¹Does not include foreign cotton. ²Cotton mills only. ³Bales of 400 pounds.

The showing made by the statistics of this table is interesting and instructive. During the period covered the production increased from 2,063,915 bales to 11,325,882 bales, the consumption of cotton from 236,525 bales to 4,539,090 bales, and the number of active spindles from 2,284,631 to 27,505,422. The most remarkable feature of the table is the increase in the industry in the cotton growing states since 1880. There were in these states twenty-eight years ago 561,360 active spindles, with a consumption of 188,748 bales; the statistics now show 10,200,903 spindles, with a consumption of 2,187,096 bales. Within the last eight years the consumption in these states increased 44 per cent, while in the New England states and in all other states it has remained practically stationary.

The consumption for 1908 in the cotton growing states was 2,187,096 bales, compared with 2,410,993 bales in 1907, a decrease of 223,897 bales, against a decrease in consumption in the New England states of 178,520 bales. The increase during the year in the number of spindles of the cotton growing states was 672,939, compared with an increase of 416,816 for the New England states. The insufficiency of labor, a factor of importance in accounting for idle

spindles in the southern group of states in 1907, has not been so much in evidence in 1908, the prevailing cause this season for the stoppage of machinery having been more the desire to prevent accumulations of cotton goods, such as might arise under existing market conditions.

In connection with the industry in the cotton growing states, the following excerpt may carry some interest and value:

The Englishman is not bewitched by local conditions in purchasing his supplies, but the southern manufacturer often awakes to the realization of the fact that the foreign spinner has secured his supply of better cotton at better prices, and that the South's one great potential advantage in raw material is lost. This would show that "a cotton mill in the cotton field," exists to-day in name only, and in many cases the advantage which is supposed to accrue to the manufacturer in reality is lost. In order to illustrate the value of this and show the relative costs in manufacturing raw cotton, an average size mill on medium brown cotton sheetings, or drills, may be used as an example. The division of the total cost varies, of course, with conditions and circumstances in such a mill, but the following are close approximations, 100 per cent representing the total cost: (1) Cost of the productive and nonproductive labor, 25 per cent; (2) starch, supplies, oils, light, heat, power, and repairs, 10 per cent; (3) salaries, insurance, taxes, interest, depreciation, general and incidental expenses, 15 per cent; and (4) raw cotton and waste, 50 per cent.

The items 1, 2, and 3, which represent roughly about one-half of the total cost of producing cotton cloth, are practically fixed. While it is true that item 3 embraces what are generally termed "fixed charges," yet, in a relative sense, items 1 and 2 are also fixed within narrow limits. The cost of the raw material is quite different. It represents one-half of the total cost, and a fluctuation in the price of cotton overnight can offset the advantage gained by the economic handling of the first three items. Herein lies the cause of many mill failures. Thus at times mills of antiquated equipment outstrip in profit those of modern equipment, solely on account of foresight in purchasing the raw material.

So long as a mill is properly organized with ample working capital, equipped with modern machinery, and properly managed, the cost of the first three items will be practically fixed. Now the cotton growing states offer opportunities for fixing the cost of the raw material within narrow limits that are not found in any other of the great cotton manufacturing localities of the world. The southern manufacturers have not yet learned to make the best of their real advantage over foreign competition. When they are able to handle this situation with foresight equal to that of manufacturers removed from the influences which tend to bias judgment in the purchase of raw material, they will have gained the full vantage which they naturally possess, and can then speak prophetically of spinning the greater portion of the American cotton crop with a surer chance of fulfillment.¹

Fine yarn spinning.—There was a decrease between 1900 and 1905 of about 5 per cent in the total quantity of coarse yarns spun in the United States, an increase of more than 11 per cent in medium yarns, and an increase of over 60 per cent in fine yarns. In 1900 the Southern states produced less than 26 per cent of the total amount of medium yarns (21's to 40's), while in 1905 this group of states produced more than 41 per cent. In 1900 the manufacturers of New England

¹Paper read by Mr. William H. Harris, manager Hamilton Carhardt Cotton Mills, Rockhill, S. C., at the Twelfth Annual Meeting of the American Cotton Manufacturers' Association, at Richmond, Va., May 20 and 21, 1908.

turned out 93 per cent of all the fine yarn, while in 1905 their proportion was 8 per cent. The manufacturers in the cotton growing states in 1900 produced barely 1 per cent of the fine yarns (41's and over), all of which was contributed by North Carolina, but in 1905 fine spinning was returned for 6 states, and the quantity produced in these states was more than 14 per cent of the total returned for the United States. These figures indicate remarkable progress in fine spinning in the South. It must not, however, be inferred that this class of spinning is being transferred from New England to the South, but rather that a decided movement is in progress throughout the country toward finer goods.

The obstacles in the way of successful manufacture of fine combed yarns in the South have been unskilled labor and climatic conditions. The latter has been solved by the scientific processes of humidification, so that the atmospheric conditions can now be kept under most excellent control, and the desired humidity obtained, which is vitally necessary for the production of fine yarns. The other obstacle—unskilled labor—still remains a serious problem, for there are comparatively few locations in these states where skilled labor can be had. This will be the chief trouble and hindrance for some years to come. The New England states have been many years in reaching their present condition of fine cotton manufacturing. Prior to the year 1880 there was only a very limited quantity of fine cotton yarns above 40's produced in the United States. The bulk of the supply was imported from England. There were a few mills that were spinning fine counts, but principally for their own consumption. For 1900, the Census gives the total of yarns, 41's and finer, manufactured in the Southern states, 886,200 pounds, which, on the basis of 50's, seven-tenths of a pound per spindle per week, would require about 25,000 spindles to produce, and by conservative estimate not over 2,500,000 spindles all told for all the states. Statistics for the Southern states in 1905 were 17,858,453 pounds, which would require on the same basis as above, 500,000 spindles to produce, showing the remarkable increase from 1900 to 1905. Of this total a conservative estimate would show that not over 25 per cent of this production was the combed quality. For 1905 the Census returns gave the total of yarns made, No. 41's and finer, as 101,253,957 pounds for the New England states alone, which would take to produce, based on 70's, four-tenths pound per spindle weekly, an aggregate of 5,500,000 spindles. There is ample room for expansion in the United States for the fine cotton spinning industry, both in cotton goods and yarns, as is clearly shown by the large importations of this grade of cotton goods.¹

For the year ending June, 1908, the importations amounted to \$68,379,781, distributed as follows: Cotton fabrics imported, \$13,460,396; cotton yarns and threads, \$3,921,111; other threads, crochet and embroidery cottons on spools and reels, and all others not classified, \$4,169,346; knit goods made from cotton yarns, \$9,032,574; lace curtains, laces and embroideries, edgings, insertions, etc., \$33,611,010; clothing ready made, wearing apparel not included in knitted goods, \$4,185,344. It will be seen that about \$21,500,000 represents importations of fine cotton

¹ Paper read by Arnold B. Sanford at the Twelfth Annual Meeting of the American Cotton Manufacturers' Association, at Richmond, Va., May 20 and 21, 1908.

cloths, cotton yarns, threads, and other fine cotton goods. For the year ending June, 1905, the total production in the United States of fine cotton yarns and goods, No. 41's and above, according to the Census, was 123,745,450 pounds, of which the value of yarns was about \$60,000,000, requiring fully 6,500,000 spindles for their production.

COTTON STOCKS IN THE UNITED STATES.

The quantity of baled cotton held on August 31, 1907 and 1908, respectively, distributed by states according to classes of holders, is shown in the following table:

TABLE 6.—Stocks of cotton held in the United States on August 31, 1908 and 1907.

STATE.	Year.	Total (bales).	COTTON IN THE ACTUAL POSSESSION OF—				
			Manu- factur- ers (bales).	Ware- houses and com- presses (bales).	Trans- porta- tion com- pan- ies (bales).	Pro- ducers (bales).	Other holders (bales).
United States.	1908	1,236,058	594,184	444,626	72,186	52,830	72,223
	1907	1,514,567	1,016,738	388,919	54,596	14,226	40,088
Alabama.....	1908	47,027	11,302	26,700	737	4,832	3,456
	1907	55,948	29,940	20,169	589	334	4,910
Arkansas.....	1908	18,221	591	13,571	(1)	1,054	3,005
	1907	11,471	825	9,589	(1)	204	853
Georgia.....	1908	122,466	19,732	82,017	8,276	6,797	5,644
	1907	105,066	62,400	34,540	2,785	1,070	4,271
Louisiana.....	1908	37,104	538	34,734	(1)	982	850
	1907	40,515	799	31,292	7,008	(1)	1,416
Mississippi.....	1908	57,852	1,735	45,789	1,918	4,005	4,405
	1907	16,433	3,491	10,577	(1)	1,123	1,242
Missouri.....	1908	11,886	1,415	10,471	.....	.....	(1)
	1907	7,208	1,168	6,040	.....	.....	(1)
North Carolina.....	1908	40,718	27,253	6,597	863	3,861	2,144
	1907	94,846	84,542	4,618	1,532	1,056	3,098
South Carolina.....	1908	76,763	32,783	31,117	1,383	5,554	5,826
	1907	113,688	96,457	12,703	1,240	775	2,488
Tennessee.....	1908	24,845	5,362	16,375	.....	2,385	723
	1907	30,341	10,508	19,282	.....	346	205
Texas.....	1908	209,283	2,178	90,506	53,069	20,707	42,223
	1907	120,469	5,443	47,011	38,011	9,123	20,881
Virginia.....	1908	6,507	4,525	1,982	.....	.....	(1)
	1907	18,926	9,085	9,841	(1)	(1)	(1)
All other states.....	1908	583,386	486,770	84,767	5,340	2,562	3,947
	1907	899,656	712,044	183,257	3,431	195	729

¹ Included in "all other states."

The distribution of stocks given in this table is very interesting because of the detailed segregation presented. In the canvass for the statistics of this report the Bureau furnished its special agents forms upon which to list and return stocks in accordance with the classifications given in the table, and they were instructed to collect full and complete returns from all holders, but as it was impracticable to make a house-to-house canvass for stocks held by growers, some estimates by these agents are involved in the returns of this cotton. The statistics are, however, approxi-

mately correct. There were 1,236,058 bales remaining in this country on August 31, 1908, compared with 1,514,567 bales in 1907. Stocks held by manufacturers at the close of the year amounted to 594,184 bales, compared with 1,016,738 bales in 1907, a decrease of 422,554 bales. The manufacturers in the cotton growing states held 112,471 bales, compared with 311,307 bales in 1907, while those in all other states held 481,713 bales, compared with 705,431 bales in 1907. The manufacturers of Massachusetts alone held 233,024 bales, or nearly 40 per cent of the total stocks in the possession of manufacturers in 1908. Independent warehouses and compresses held 444,626 bales in 1908, compared with 388,919 bales in 1907. The cotton in the possession of transportation companies, producers and merchants, buyers, ginners, and cottonseed-oil mills was also larger than at the corresponding date last year, owing to the earlier maturity of the crop this season.

The general business of handling raw staple products in the United States has in recent years received much attention, and in this era of economic progress consideration is being given to the matter of improved storage facilities for cotton, although not before a serious need for such facilities had arisen. For this reason it is gratifying to note the increase in the proportion of cotton stored in warehouses, as shown by the statistics of Table 6, if this condition points to a greater regard for the staple and a consequent more careful handling.

The increased value of raw cotton in the last five years has brought from consumers stringent protests against antiquated methods of caring for the staple. Probably the most important question in connection with the cotton industry and trade to-day is that of adequate warehousing facilities. Practically the entire crop is harvested, ginned, and baled within four months, and during this period some 75 per cent of it reaches commercial channels. The deficiency in storage facilities in the cotton growing states, together with a lack of appreciation on the part of growers, factors, and others, of the necessity for properly caring for cotton, are the causes of a deplorable condition. Too frequently the producer permits his baled cotton to remain for weeks exposed to the weather, or stored under leaking shelters. Being thus careless himself he naturally makes few requirements of his factor or agent at the shipping centers, into whose hands the cotton subsequently comes. Thus it is that during the months when the movement of the crop is heaviest, the streets are frequently made dumping places for baled cotton, and this valuable product is again subjected to the action of sunshine, rain, mud, and dirt, which, with the exposure on the farms just referred to, results in what is commonly termed "country damage." Serious losses are sustained because of these conditions, and it is gratifying that all concerned are

beginning to realize the necessity for more careful handling, that well regulated warehousing is growing in favor, and that the required facilities are rapidly increasing.

Exports.—Table 7 shows the quantity of domestic raw cotton exported from the United States, by customs districts, during the years ending August 31, 1906, 1907, and 1908.

TABLE 7.—Exports of domestic raw cotton from the United States, by customs districts: 1906 to 1908.¹

CUSTOMS DISTRICT.	1908 (running bales).	1907 (running bales).	1906 (running bales).
Total.....	7,573,349	8,503,265	6,763,041
Bangor, Me.....	982	240	1,882
Passamaquoddy, Me.....	7,950	4,591	5,763
Portland and Falmouth, Me.....	1	7,389	1,880
Boston and Charlestown, Mass.....	156,780	156,788	147,030
New York, N. Y.....	619,453	450,476	520,024
Philadelphia, Pa.....	56,138	41,091	39,886
Baltimore, Md.....	117,932	165,221	156,178
Newport News, Va.....	1,635	6,140	7,183
Norfolk and Portsmouth, Va.....	40,985	9,514	27,239
Wilmington, N. C.....	492,830	317,507	320,083
Charleston, S. C.....	44,518	21,429	9,900
Savannah, Ga.....	892,080	923,679	970,002
Brunswick, Ga.....	176,015	141,940	148,551
Fernandina, Fla.....	—	100	674
Key West, Fla.....	—	—	2
Pensacola, Fla.....	173,213	155,691	176,277
Mobile, Ala.....	259,590	163,203	140,301
New Orleans, La.....	1,870,709	2,072,357	1,570,844
Sabine, Tex.....	108,500	13,711	(²)
Galveston, Tex.....	2,301,168	3,448,006	2,269,029
Saluria, Tex.....	462	—	3,529
Faso del Norte, Tex.....	329	—	1,150
Corpus Christi, Tex.....	677	575	5,831
Brazos de Santiago, Tex.....	—	—	1,688
Porto Rico.....	117	16	748
Arizona.....	924	3	458
San Francisco, Cal.....	48,672	83,123	38,392
Willamette, Ore.....	1,050	1,001	4,849
Puget Sound, Wash.....	101,800	146,645	65,022
North and South Dakota.....	115	4,232	5,839
Minnesota.....	200	53	25
Detroit, Mich.....	54,868	88,804	73,902
Huron, Mich.....	23,542	10,574	29,474
Niagara, N. Y.....	681	338	226
Buffalo Creek, N. Y.....	757	773	225
Cape Vincent, N. Y.....	12	18	18
Champlain, N. Y.....	1,006	10,509	6,011
Oswegatchie, N. Y.....	337	3,867	952
Vermont, Vt.....	6,851	2,854	4,717
Memphremagog, Vt.....	10,469	11,987	9,077

¹Compiled by the Bureau of Statistics, Department of Commerce and Labor, for the years ending August 31.

²Included with exports from Galveston prior to March 1, 1907.

The exports of domestic raw cotton from the United States in 1908 were less than those for 1907 by 929,916 bales, and exceeded those for 1906 by 810,308 bales. Only 16 per cent of the cotton exported during 1908 is credited to ports outside of the cotton growing states, while that exported from the ports of Galveston, New Orleans, and Savannah represented about two-thirds of the total. The exports from Galveston alone amounted to 30 per cent of the total for the country and were greater than the entire production of Texas in 1907.

Receipts, by ports.—In connection with the figures given in Table 7 showing the exports of domestic raw cotton, by customs districts, it is interesting to observe the development of the different ports and the drift of the cotton trade through them, which are brought out in the statistics of net receipts for selected ports given in Table 8

TABLE 8.—NET RECEIPTS OF COTTON AT SELECTED PORTS: 1875 TO 1908.¹

PORT.	NET RECEIPTS OF COTTON (RUNNING BALES).									
	1908	1907	1906	1905	1900	1895	1890	1885	1880	1875
Galveston.....	2,633,429	3,891,695	2,656,600	2,879,336	1,710,263	1,659,999	860,112	463,463	480,352	354,927
New Orleans.....	1,995,204	2,296,971	1,653,142	2,689,520	1,867,153	2,584,115	1,973,571	1,529,592	1,504,654	993,461
Mobile.....	516,321	260,300	250,350	329,556	340,646	253,187	261,957	237,071	358,971	320,822
Pensacola.....	(²)	149,639	166,075	195,151	(²)	(^{2})	(^{2})	(^{2})	(^{2})	(^{2})
Brunswick.....	214,496	163,928	180,853	199,193	94,278	(²)	(^{2})	(^{2})	(^{2})	(^{2})
Savannah.....	1,531,502	1,468,633	1,514,953	1,877,343	1,088,807	944,410	956,517	728,087	741,018	606,727
Charleston.....	203,491	149,924	180,604	225,366	265,523	425,487	327,079	507,802	464,332	412,931
Wilmington.....	501,483	320,668	325,818	375,383	282,360	234,621	134,916	94,054	78,876	76,601
Norfolk and Newport News.....	578,151	642,895	683,661	841,174	432,727	472,540	404,056	545,418	590,032	387,279
Baltimore.....	89,735	70,825	68,067	72,427	101,648	(²)	(^{2})	(^{2})	(^{2})	(^{2})
Philadelphia.....	9,803	11,021	10,317	13,645	36,238	(²)	(^{2})	(^{2})	(^{2})	(^{2})
New York.....	4,228	23,108	6,575	33,798	119,215	187,794	176,502	99,200	229,426	179,163
Boston.....	15,822	72,655	68,828	83,644	118,891	(^{2})	(^{2})	(^{2})	(^{2})	(²)

¹ Compiled from Commerce and Finance of the United States. The figures are for the years ending August 31.

² Includes receipts of Pensacola.

³ Included in receipts of Mobile.

⁴ Not shown separately.

One of the most striking features of the statistics presented in Table 8 is the remarkable increase in the net receipts of cotton at the Gulf ports. For instance, the receipts at Galveston and New Orleans have increased steadily and rapidly since 1875, the increase in the combined receipts of these two ports for 1907 over those for 1875 amounting to 4,840,258 bales. This remarkable development is to be attributed to the large increase in cotton growing in the states of Texas and Oklahoma, which have transportation connections centering in these ports. It may be noted that the cotton crop of Texas in 1879 was only 805,284 commercial bales, compared with 2,267,293 bales in 1907 and 4,066,472 bales in 1906.

Another noteworthy feature of the statistics in the above table is the drift of the cotton trade in certain of the Atlantic ports. Charleston shows 412,931 bales in 1875 and 507,802 bales in 1885, but in 1908 the receipts were only 203,491 bales; on the other hand, Wilmington increased gradually from 76,601 bales in 1875 to 501,483 bales in 1908. The receipts at Nor-

folk have nearly doubled, while those of Savannah have more than doubled during the period covered by the table. These conditions have been brought about largely by the trend in the development of the interior transportation facilities and by the establishment of ocean transportation routes.

It may be interesting, in this connection, to observe that the average ocean freight rate from the United States to Liverpool, according to statistics published by the Department of Agriculture, is 32 cents per 100 pounds, the average railway rate from the local shipping point to all ports 40 cents, and the average cost of transportation from the farm to the shipping point 16 cents, which gives an estimated total freight charge from the hands of the producer to the cotton merchant in Liverpool, not including terminal charges, of 88 cents for 100 pounds, or \$4.40 per 500-pound bale.

The following table shows the exports of domestic raw cotton, from 1820 to 1907, by countries to which exported:

TABLE 9.—EXPORTS OF DOMESTIC COTTON, BY COUNTRIES TO WHICH EXPORTED: 1820 TO 1907.¹

[500-pound bales.]

YEAR.	Total.	United Kingdom.	Germany.	France.	Italy.	Spain.	Belgium.	Russia.	Austria-Hungary.	Sweden and Norway.	Netherlands.	Denmark.	All other Europe.	Japan.	Canada.	Mexico.	All other countries.
1907...	7,633,997	2,956,352	2,385,663	889,083	418,921	262,744	119,470	98,371	90,049	35,330	27,684	4,538	22,257	200,396	113,997	4,767	4,375
1906...	9,036,434	3,966,119	2,315,651	1,006,633	567,919	275,868	154,168	121,141	113,630	37,849	29,092	9,250	17,984	202,283	150,343	732	7,775
1905...	7,268,090	3,181,143	1,871,441	817,583	486,007	241,747	114,673	112,480	56,375	28,408	18,490	14,663	1,415	147,269	141,908	29,235	4,603
1904...	8,609,698	3,967,254	2,011,679	818,304	534,735	295,537	145,504	129,600	62,572	40,349	31,163	11,631	20,931	336,575	115,857	79,082	9,405
1903...	6,126,386	2,475,752	1,797,354	734,285	363,295	184,862	105,213	168,506	28,158	19,433	16,055	29,150	12,905	45,870	88,795	56,172	580
1902...	7,086,086	2,799,096	1,915,094	806,673	444,950	266,336	157,351	181,938	39,912	31,112	42,542	34,061	17,070	152,826	127,640	66,507	2,978
1901...	7,001,558	3,132,324	1,705,815	775,773	445,437	270,602	132,232	73,446	39,757	11,545	22,418	39,129	11,005	178,505	129,016	27,500	7,054
1900...	6,661,781	3,106,857	1,629,935	754,329	365,359	237,346	154,632	63,171	37,238	12,615	53,180	26,359	13,351	78,558	102,980	25,103	7,118
1899...	6,201,166	2,302,128	1,619,173	736,092	443,951	246,612	148,319	54,950	44,919	14,773	74,635	31,990	18,872	323,202	109,883	18,522	13,405
1898...	7,546,821	3,609,444	1,728,975	803,406	417,353	248,635	129,524	95,012	57,127	23,624	51,621	39,249	21,627	182,734	98,230	36,130	4,130
1897...	7,700,529	3,532,101	1,858,525	842,038	387,581	263,648	161,941	103,825	35,614	25,613	43,509	24,741	18,835	224,214	122,495	42,433	13,416
1896...	6,207,510	3,127,186	1,371,577	716,025	323,117	219,083	83,485	84,570	29,971	12,535	34,731	25,288	10,987	64,022	30,408	30,207	333
1895...	4,670,453	2,267,222	1,038,457	478,265	261,644	216,178	87,966	61,622	15,912	27,512	14,219	18,473	5,382	40,388	68,074	38,817	322
1894...	7,034,696	3,553,782	1,619,173	780,699	332,656	255,679	145,340	141,998	24,852	36,460	26,999	2,366	16,493	22,130	105,534	75,953	294
1893...	5,366,565	2,970,903	909,389	610,854	211,716	225,364	128,907	140,082	960	29,961	18,581	2,628	7,097	9,603	65,085	35,165	270
1892...	4,424,230	2,363,176	850,387	568,059	160,010	200,212	90,399	36,356	.....	13,758	26,614	966	7,725	1,586	62,988	41,812	173
1891...	5,870,440	3,132,685	964,883	692,785	171,003	187,458	134,373	10,052	33,781	27,925	746	4,469	3,149	79,228	44,235	276	276
1890...	5,814,718	3,401,212	1,019,144	553,100	194,022	218,836	97,422	135,611	4,447	37,000	43,669	204	10,274	4,813	68,261	25,682	20
1889...	4,943,600	2,905,152	837,641	484,759	129,751	175,339	93,588	193,163	300	11,124	17,438	3,955	4,848	.....	58,473	28,095	1,974
1888...	4,766,633	2,940,800	660,756	400,197	131,068	181,533	147,807	144,036	5,610	8,717	44,354	8,088	1,459	.....	61,143	33,902	263

¹ Compiled from Commerce and Navigation of the United States. The statistics of exports differ slightly since 1865 from those shown in Table 15 because of a difference in years to which they relate. The figures are for the fiscal years beginning July 1.

TABLE 9.—EXPORTS OF DOMESTIC COTTON, BY COUNTRIES TO WHICH EXPORTED: 1820 TO 1907—Continued.

[500-pound bales.]

YEAR.	Total.	United Kingdom.	Germany.	France.	Italy.	Spain.	Belgium.	Russia.	Austria-Hungary.	Sweden and Norway.	Netherlands.	Denmark.	All other Europe.	Japan.	Canada.	Mexico.	All other countries.
1887...	4,528,242	2,838,525	560,624	392,197	110,375	169,331	130,791	216,798	-----	9,309	27,725	8,713	236	-----	52,052	11,414	152
1888...	4,338,915	2,713,615	561,664	466,090	73,222	138,499	110,288	151,267	-----	10,361	43,735	10,158	-----	47,904	11,951	281	
1889...	4,116,075	2,444,482	569,435	401,043	110,473	108,414	125,069	184,924	5,252	14,985	31,672	1,375	293	-----	37,425	21,035	193
1890...	3,783,319	2,419,834	468,987	361,462	79,041	135,319	85,664	135,131	3,898	13,546	37,930	4,112	82	-----	26,398	11,754	151
1891...	3,725,145	2,384,254	363,055	457,309	51,725	135,928	30,863	193,639	1,762	8,598	53,913	2,323	106	-----	19,216	22,368	26
1892...	3,576,150	2,776,411	538,583	428,829	80,807	196,939	42,055	347,353	4,656	21,912	57,610	5,510	1,358	-----	32,636	61,155	535
1893...	3,479,952	2,361,793	324,962	333,541	44,073	115,264	4,732	154,234	189	11,527	33,820	5,178	-----	35,159	25,075	405	
1894...	4,381,857	2,729,672	468,192	553,854	75,145	127,741	18,318	267,714	4,218	16,310	67,602	-----	1,901	-----	25,960	26,772	558
1895...	3,844,122	2,433,255	308,045	359,693	59,126	133,873	17,896	204,500	1,699	20,619	65,325	-----	478	-----	19,619	19,763	231
1896...	3,256,746	1,967,549	274,969	393,977	47,617	141,215	19,127	308,647	2,533	12,056	51,734	-----	1,224	-----	15,481	10,796	821
1897...	3,215,067	2,079,897	243,298	472,062	36,221	81,371	28,383	170,858	3,636	20,087	55,909	-----	2,326	-----	14,165	6,844	10
1898...	2,890,738	2,040,731	155,211	438,178	23,096	92,061	4,597	50,219	-----	13,202	53,711	-----	-----	-----	11,017	7,940	775
1899...	2,982,811	1,914,660	217,092	407,552	46,759	95,122	31,076	161,794	-----	14,994	68,532	-----	25	-----	9,961	13,945	899
1900...	2,520,838	1,823,884	150,570	310,279	18,084	59,627	6,227	131,417	-----	2,864	8,141	-----	12	-----	7,123	2,610	-----
1901...	2,717,205	1,807,144	229,227	354,731	24,597	106,718	17,107	108,181	-----	18,040	38,009	-----	1	-----	8,022	4,579	840
1902...	2,400,127	1,717,299	190,685	226,740	30,568	55,444	24,253	99,147	2,758	10,915	38,172	-----	1	-----	2,988	1,101	56
1903...	1,867,075	1,407,830	85,033	176,374	11,845	65,142	20,197	49,367	-----	-----	45,570	-----	-----	-----	3,792	1,914	10
1904...	2,925,856	2,204,645	207,972	119,223	42,815	94,312	35,867	62,271	4,330	13,774	111,405	-----	446	-----	4,786	22,619	1,291
1905...	1,917,117	1,238,332	173,552	306,293	14,549	55,409	3,452	30,341	-----	-----	17,050	-----	1,621	-----	3,122	13,219	177
1906...	1,283,656	879,087	140,855	201,116	8,956	32,317	374	19,525	-----	-----	5,331	212	324	-----	2,244	4,064	231
1907...	1,569,527	1,129,030	152,643	186,466	12,066	51,241	1,608	11,748	331	-----	5,045	530	145	-----	2,091	16,457	126
1908...	1,322,047	1,048,641	56,396	167,858	7,223	22,068	1,775	10,179	-----	-----	514	-----	214	-----	1,288	6,622	169
1909...	1,301,146	1,024,728	32,276	216,470	397	17,631	653	5,372	-----	647	283	460	-----	1,643	101	485	
1910...	13,214	12,009	283	714	-----	-----	-----	-----	-----	-----	-----	-----	-----	184	-----	24	
1911...	23,988	19,302	47	3,557	117	-----	-----	-----	-----	-----	-----	-----	-----	110	835	20	
1912...	22,770	19,681	-----	2,534	-----	-----	-----	-----	-----	-----	26	-----	-----	303	-----	226	
1913...	10,129	7,091	17	46	1,688	1,166	-----	-----	-----	-----	-----	-----	-----	115	-----	6	
1914...	615,032	414,685	23,798	114,541	9,373	22,310	11,364	8,502	-----	1,166	5,301	-----	601	303	2,821	267	
1915...	3,535,373	2,528,274	132,145	567,935	54,037	88,044	29,601	43,396	14,943	23,326	25,515	-----	6,687	2,771	18,087	612	
1916...	2,772,937	1,887,372	131,362	372,981	42,977	121,046	28,657	87,240	33,113	22,065	32,311	-----	625	114	11,987	1,087	
1917...	2,237,248	1,561,905	88,872	357,580	38,996	79,261	18,691	64,220	13,960	8,115	16,995	-----	219	261	18,169	4	
1918...	2,096,565	1,367,996	89,866	348,469	34,480	91,114	24,495	63,867	15,229	20,076	20,869	2,353	115	1,715	15,917	4	
1919...	2,702,863	1,798,563	124,219	443,535	41,710	116,959	46,343	9,257	37,306	34,579	26,193	2,336	1,279	8,317	12,021	123	
1920...	2,016,849	1,346,997	61,642	420,228	49,787	66,143	24,439	898	1,910	16,857	9,883	418	808	1,766	15,054	19	
1921...	1,975,666	1,392,494	75,440	288,857	25,452	70,048	27,961	5,330	29,922	18,426	12,096	66	3,097	145	24,292	1,540	
1922...	2,223,141	1,537,193	46,280	378,454	34,976	73,702	30,980	42,573	35,937	12,199	14,078	871	393	24	14,928	544	
1923...	2,186,461	1,505,143	44,277	372,423	35,868	53,604	54,316	20,590	47,897	11,878	20,518	74	444	33	13,400	626	
1924...	1,854,474	1,341,290	34,480	278,329	20,641	68,545	32,670	20,197	34,618	10,322	11,018	-----	317	47	1,692	308	
1925...	1,270,763	863,062	10,090	251,663	18,707	55,353	25,492	8,077	18,492	7,248	8,590	48	236	89	2,627	384	
1926...	2,053,204	1,478,630	207,989	302,680	33,316	46,572	56,227	21,301	26,559	14,061	23,775	9	11,933	194	4,437	5,761	
1927...	1,628,549	1,144,006	35,074	272,596	17,184	38,647	30,559	20,534	40,868	9,723	9,703	138	268	45	-----	9,204	
1928...	1,054,440	702,538	21,779	204,235	26,431	24,627	20,369	11,237	23,561	5,775	3,957	1,322	180	208	-----	8,221	
1929...	1,935,116	1,391,317	15,391	264,106	28,020	235	14,817	8,585	26,764	5,112	7,700	64	2,148	95	8,785	20,377	
1930...	1,745,812	1,210,290	34,605	295,659	13,714	673	28,595	14,901	41,786	4,732	25,039	231	2,624	166	3,323	69,024	
1931...	1,327,267	973,459	240,120	6,346	8,249	-----	19,771	5,536	24,456	2,393	6,155	46	171	2,797	11,898	13,291	
1932...	1,584,594	1,169,691	30,807	273,629	18,371	-----	30,287	6,858	12,032	305	16,348	90	503	6	3,265	22,702	
1933...	1,160,434	757,395	19,525	311,643	8,817	-----	16,455	5,668	14,187	1,784	16,783	90	603	36	-----	16,448	
1934...	1,060,408	696,613	12,992	278,790	3,738	36	19,632	1,972	16,263	3,664	5,270	36	494	553	-----	20,355	
1935...	1,487,882	999,830	18,317	358,180	7,805	1,049	25,780	4,406	26,336	4,301	21,698	13	846	59	-----	29,262	
1936...	827,248	621,548	1,780	179,565	10	1,179	2,711	4,209	4,741	1,645	3,731	83	1,542	-----	-----	4,504	
1937...	1,191,905	883,716	9,437	240,649	460	5,663	11,405	5,577	11,314	1,430	15,291	402	1,237	13	112	5,199	
1938...	888,423	643,159	7,530	198,617	1,107	4,665	3,539	1,995	16,860	1,687	4,345	627	1,295	16	4	2,977	
1939...	847,263	585,038	14,130	202,727	322	3,252	7,960	2,833	13,925	2,345	8,841	1,551	2,971	22	14	1,332	
1940...	774,718	540,169	5,414	200,994	26	1,756	2,818	1,950	9,896	1,273	8,555	556	134	26	-----	1,161	
1941...	769,436	569,448	13,235	159,897	382	1,786	2,410	2,521	7,611	1,208	9,848	208	712	18	-----	152	
1942...	649,397	476,484	3,751	153,666	-----	1,516	2,619	2,895	2,215	1,469	2,727	471	848	36	296	404	
1943...	644,430	458,015	8,150	154,935	1,162	4,568	(¹)	1,678	3,309	1,398	7,840	611	1,747	72	-----	945	
1944...	553,960	441,634	4,834	92,257	612	1,111	-----	1,524	5,558	1,138	1,945	1,425	1,175	678	-----	69	
1945...	596,918	419,661	2,246	150,212	471	64	-----	223	5,629	735	17,135	269	253	19	-----	1	
1946...	529,674	349,120	13,746	134,408	2,113	-----	-----	456	8,142	702	19,196	352	605	21	-----	523	
1947...	421,181	293,666	6,782	106,962	814	-----	-----	1,300	1,961	640	7,562	226	987	33	-----	248	
1948...	538,620	425,415	6,797	140,84													

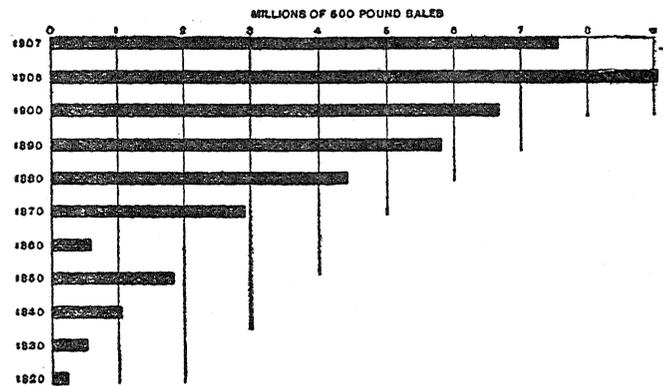
Table 9 shows the development in the exports of raw cotton, and is very instructive, as it covers practically the entire period during which cotton has been produced in this country for commercial purposes. The statistics in this table are not comparable with those in Table 7, because of a difference in the year and in the bale unit employed. The quantity exported during the fiscal year beginning July 1, 1907, amounted to 7,633,997 bales of 500 pounds each, of which 2,956,352 bales, or 39 per cent, went to the United Kingdom; 2,385,663 bales, or 31 per cent, to Germany; and 889,083 bales, or 12 per cent, to France. These three countries took 82 per cent of the total quantity exported.

The table does not in all instances show the final destination of American cotton exported, because of the present indirect transportation connections—cotton shipments from the United States, in many instances, being consigned to intermediate points and thence transported to the places of ultimate destination.

During the period covered by this table the exports of raw cotton increased from less than 250,000 bales of 500 pounds each to 9,036,434 bales reported in 1906, and 7,633,997 bales in 1907. A noteworthy feature of the table is the general distribution and development of the export trade since 1880, at which time the United Kingdom took two-thirds of all the American cotton exported, France, one-tenth, and Germany, one-twelfth, while in 1907 the United Kingdom took about two-fifths, Germany, nearly one-third, and France, one-eighth. During the twenty-six years from 1880 to 1906 the exports to the United Kingdom increased 45 per cent, those to Germany, nearly 400 per cent, and those to France, 82 per cent. The exports to Italy increased from 75,145 bales in 1880 to 418,921 bales in 1907, or nearly fivefold. Exports to Japan are noteworthy because of the remarkable variations in the quantities for the different years, as well as for the growth of these exports since 1890, which is the first year for which they were shown in the table. In 1907 they amounted to 200,396 bales, while for 1904 they were 336,575 bales. The exports to Canada amounted to 25,960 bales in 1880 and 113,997 in 1907. Russia and the Netherlands both show decreases during this period, the former from 267,714 bales to 98,371 bales, and the latter from 67,502 bales to 27,684 bales. The decrease in the exports to Russia may be accounted for partially by the increased production of cotton in Russian territory, the importation of Persian cotton, and recent unsettled conditions in that country.

The growth and development of the export trade in domestic raw cotton is graphically illustrated by the following diagram:

DIAGRAM 2.—Exports of domestic cotton for specified years: 1820 to 1907.



Exports of sea-island cotton.—Because of the great interest that attaches to sea-island cotton, which is quite out of proportion to the volume of its production and is brought about by its special use in the manufacture of sewing thread and laces and for similar purposes requiring an extra long fiber, it will be of interest to introduce here the available statistics of exports of this cotton. Tables 10 and 11 are therefore presented, the former showing the exports of sea-island cotton for selected years since 1885, by countries to which exported, and the latter the yearly exports of this cotton since 1805. It will be understood, of course, that the statistics given in these tables are included in the general statistics of domestic exports of cotton shown in other tables of this report.

TABLE 10.—Exports of sea-island cotton, by countries to which exported, for selected years: 1885 to 1908.¹

[500-pound bales.]

COUNTRY.	1908	1907	1906	1900	1895	1890	1885
Total.....	25,399	15,212	32,492	36,400	30,523	18,442	13,528
United Kingdom.....	17,874	11,056	23,870	30,331	26,350	16,853	11,950
France.....	7,112	3,925	6,787	5,193	3,878	1,420	1,560
Germany.....	413	185	838	796	36	169	13
All other countries.....	.....	46	997	80	259	.....	5

¹ The figures are for the years ending June 30.

The production of sea-island cotton in 1907, according to returns of ginners, was 86,895 bales, equivalent to 34,030,736 pounds. Nearly 38 per cent of the crop of 1907 was exported, as compared with about 34 per cent of the crop for 1906. The United Kingdom takes about three-fourths of the entire amount exported and France most of the remainder. It is noteworthy that the quantity of sea-island cotton exported in 1805 was more than 1,000,000 pounds in excess of that for 1907, and the statistics for 1908 are only about 4,000,000 pounds in excess of what the exports were 103 years ago.

TABLE 11.—QUANTITY, VALUE, AND PRICE PER POUND OF SEA-ISLAND COTTON EXPORTED FROM THE UNITED STATES: 1805 TO 1908.¹

YEAR.	Bales.	Quantity (pounds).	Value.	Average price per pound (cents).	YEAR.	Bales.	Quantity (pounds).	Value.	Average price per pound (cents).
1908	33,286	12,793,160	\$3,370,025	26.3	1856		12,797,225		
1907	20,222	7,625,985	2,052,606	27.3	1855		13,058,590		
1906	41,111	15,812,223	3,240,509	20.5	1854		10,480,423		
1905	40,376	15,906,209	3,223,271	20.3	1853		11,165,185		
1904	34,046	12,750,616	2,880,827	22.7	1852		11,738,075		
1903	55,075	21,555,348	4,481,153	20.8	1851		8,299,656		
1902	31,262	12,072,090	2,453,722	20.3	1850		8,236,463		
1901	31,688	12,380,234	2,383,539	19.3	1849		11,969,259		
1900	46,117	18,124,723	2,973,935	16.4	1848		7,724,148		
1899	33,922	13,294,378	2,216,234	16.7	1847		6,293,973		
1898	41,778	16,201,806	2,875,741	17.7	1846		9,388,533		
1897	55,824	21,751,255	4,104,819	19.0	1845		9,389,625		
1896	49,811	19,228,199	3,831,852	18.9	1844		6,099,076		
1895	39,250	15,227,676	2,773,610	18.2	1843		7,515,079		
1894	36,095	13,830,942	2,818,397	20.4	1842		7,254,099		
1893	20,841	8,033,070	1,770,020	22.6	1841		6,400,000		
1892	23,381	9,278,332	1,630,020	17.6	1840		8,779,669		
1891	38,204	14,766,245	3,105,707	21.0	1839		5,107,404		
1890	24,467	9,284,294	2,289,037	24.7	1838		7,286,340		
1889	17,089	6,299,608	1,367,999	21.7	1837		5,286,971		26.0
1888	19,935	7,051,762	1,668,208	23.9	1836		8,544,419		25.0
1887	21,829	7,953,972	1,787,183	22.5	1835		7,752,736		24.5
1886	13,389	4,613,675	1,170,025	25.5	1834		8,085,935		19.7
1885	18,645	6,764,033	1,688,635	24.9	1833		11,142,987		16.2
1884	11,094	3,598,866	1,160,073	32.3	1832		8,743,373		13.7
1883	17,166	5,692,079	1,662,281	29.2	1831		8,311,762		13.7
1882	13,975	4,853,592	1,398,296	28.8	1830		8,147,165		16.0
1881	20,560	7,138,351	2,161,207	30.3	1829		12,833,307		15.0
1880	14,094	5,061,634	1,683,900	33.0	1828		11,288,419		16.0
1879	11,461	4,030,228	1,108,072	27.5	1827		15,140,798		14.7
1878	16,455	6,325,147	1,616,214	25.6	1826		5,972,552		20.0
1877	9,863	3,394,724	1,084,509	31.9	1825		9,655,278		28.5
1876	8,204	2,644,791	941,803	35.6	1824		9,525,722		19.2
1875	12,647	4,439,120	1,538,769	34.7	1823		12,136,688		17.5
1874	19,290	6,426,524	2,114,124	32.9	1822		11,250,635		19.0
1873	16,463	5,663,909	2,350,687	41.3	1821		11,344,066		21.2
1872	8,029	2,709,105	1,410,303	52.1	1820		6,020,101		
1871	9,663	3,212,988	1,437,539	44.7	1819		3,442,186		
1870	17,341	5,409,780	2,906,433	53.7	1818		3,080,838		
1869		2,785,244	2,374,892	85.3	1817		8,101,880		
1868		4,998,315	3,023,334	60.5	1816		9,900,326		
1867		6,742,314	4,354,841	64.6	1815		8,449,951		
1866		7,284,473	6,424,770	88.0	1814		2,520,388		
1865		330,584	296,179	98.5	1813		4,134,849		
1864		139,521	127,783	95.7	1812		4,367,806		
1863		527,747			1811		8,029,576		
1862		66,443			1810		8,604,078		
1861		6,170,321			1809		8,664,213		
1860		15,598,698			1808		949,051		
1859		13,713,556			1807		8,926,011		
1858		12,101,058			1806		6,096,082		
1857		12,940,725			1805		8,787,659		

¹ Compiled by the Bureau of Statistics, Department of Commerce and Labor. From 1887 to 1908 the statistics relate to the years ending August 31, prior to 1887 the fiscal years.

Exports and imports of cotton manufactures.—The following table distributes the exports of domestic manufactures of cotton for the last fiscal year, by countries to which exported:

TABLE 12.—EXPORTS OF DOMESTIC MANUFACTURES OF COTTON, BY COUNTRIES TO WHICH EXPORTED, FOR THE YEAR ENDING JUNE 30, 1908.

COUNTRY.	Total value.	CLOTHS.						WEARING APPAREL.	COTTON WASTE.		YARN AND THREAD.	ALL OTHER.
		Unbleached.		Bleached.		Dyed, colored, or printed.			Pounds.	Value.		
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.					
Total.....	\$25,177,758	101,833,072	\$6,930,007	23,896,769	\$1,529,057	80,264,971	\$5,809,019	\$4,701,479	45,784,473	\$2,631,595	\$400,600	\$3,176,001
Europe:												
United Kingdom.....	2,487,349	1,881,642	379,642	53,687	5,755	412,610	44,901	1,010,063	11,472,599	763,311	22,324	261,353
Germany.....	1,140,332	58,070	8,951	2,490	776	7,955	636	92,183	19,300,145	972,090	.....	66,196
Turkey (including Asiatic Turkey).....	164,999	2,083,303	148,012	42,738	3,596	98,583	10,174	1,959	.....	.....	.....	1,258
Belgium.....	181,189	.....	.....	.....	.....	.....	.....	8,310	3,870,390	166,797	1,696	4,388
Italy.....	144,691	5,444	345	.....	.....	84,138	4,435	9,864	1,666,644	121,425	.....	8,622
Netherlands.....	52,210	12,942	4,193	.....	.....	1,232	112	31,567	115,093	2,365	1,050	12,923
France.....	156,041	120,000	5,820	.....	.....	.....	.....	5,584	1,636,670	138,976	235	5,426
Norway.....	14,549	2,566	5,463	850	73	17,901	1,743	2,241	.....	.....	.....	5,029
Portugal.....	11,597	49,674	9,283	10,047	993	6,285	422	202	4,684	410	130	157
Russia (including Asiatic Russia).....	65,852	52,247	11,218	.....	.....	73,673	7,387	4,673	.....	.....	.....	42,574
Denmark.....	15,564	3,787	716	.....	.....	.....	.....	2,604	205,143	4,880	4,109	3,255
Spain.....	73,771	.....	.....	.....	.....	.....	.....	1,038	791,615	70,616	.....	1,117
Sweden.....	31,207	7,284	25,326	589	50	3,000	275	2,440	.....	.....	1,635	1,481
All other Europe.....	62,071	302,426	23,699	152,328	11,448	41,206	4,059	4,453	127,478	10,982	.....	7,430
America:												
Canada.....	3,279,519	728,396	65,864	1,720,391	174,208	3,168,108	295,516	933,962	5,099,751	284,567	179,890	1,345,512
Mexico.....	869,244	405,724	65,020	300,976	30,850	1,050,727	91,802	409,431	176,127	9,819	4,153	259,160
Panama.....	763,625	345,667	36,319	289,661	27,862	2,608,309	173,752	382,404	453,519	29,064	286	112,938
San Salvador.....	368,999	5,081,149	263,765	74,047	6,482	1,513,683	88,617	3,844	4,814	320	.....	5,971
Honduras.....	391,352	1,576,523	83,417	455,301	39,511	2,475,414	187,072	44,805	11,949	640	.....	35,907
Guatemala.....	233,270	658,211	39,180	69,767	6,627	1,704,562	133,384	22,567	6,291	408	.....	28,104
Nicaragua.....	246,222	234,166	14,367	202,929	17,651	2,077,249	151,137	37,578	5,799	336	.....	25,153
Costa Rica.....	210,824	723,488	39,787	91,561	6,962	2,067,321	119,366	25,437	27,003	1,643	978	16,651
British Honduras.....	148,132	102,137	6,365	168,140	15,112	814,824	60,579	39,062	9,598	60	.....	26,479
Cuba.....	1,585,376	10,358,191	530,255	885,770	66,264	6,581,781	449,450	322,364	457,001	27,939	373	188,731
Haiti.....	742,978	1,546,480	95,852	318,366	21,539	7,884,747	614,411	2,574	13,072	1,036	667	6,899
Santo Domingo.....	473,761	485,111	30,284	493,414	35,839	5,079,174	364,315	27,041	19,653	1,365	3,063	11,854
British West Indies.....	654,315	1,243,991	88,568	358,310	29,850	6,084,816	392,756	102,430	19,550	1,470	728	38,513
Dutch West Indies.....	77,313	274,253	23,374	16,327	2,738	647,934	39,391	9,247	4,530	321	212	2,030
Danish West Indies.....	19,187	18,014	2,742	2,299	186	106,226	7,910	4,701	8,663	605	.....	3,041
French West Indies, Miquelon, etc.....	7,255	13,867	2,857	75	10	26,839	1,737	646	1,050	73	.....	1,932
Bermuda.....	32,996	10,749	1,940	11,871	1,183	88,676	6,600	16,561	2,188	194	.....	6,518
Chile.....	616,814	7,232,737	496,729	494,027	45,773	536,936	44,711	6,089	12,895	977	5,348	16,137
Colombia.....	624,587	1,021,517	60,707	586,103	35,081	7,980,516	472,821	28,853	12,877	865	2,039	24,221
Brazil.....	373,545	105,560	22,039	16,196	16,196	3,240,457	247,409	19,719	16,949	1,208	6,706	60,268
Argentina.....	221,376	630,308	81,273	99,043	8,032	189,971	17,793	3,089	27,656	1,893	85,406	23,890
Venezuela.....	319,937	1,480,364	113,219	80,683	8,919	2,551,302	164,156	3,658	17,863	1,401	167	28,417
Guiana.....	82,748	216,862	19,977	3,210	484	671,687	49,687	7,489	1,493	97	.....	5,014
Uruguay.....	91,654	428,254	59,494	117,061	11,975	134,448	12,504	7,815	8,084	557	988	3,751
Peru.....	132,409	313,755	22,733	336,529	23,212	561,962	47,329	20,192	106,956	7,733	36	11,174
Ecuador.....	97,654	129,574	14,947	26,794	2,290	868,250	58,637	9,455	16,423	1,173	.....	5,152
Bolivia.....	199,855	2,176,868	128,918	339,462	23,473	480,555	33,780	4,306	12,411	733	.....	8,645
Paraguay.....	222	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	222
Asia:												
China.....	3,413,248	33,854,835	2,328,974	14,676,435	761,383	1,347,294	86,384	224,135	.....	.....	12,852	9,520
Aden.....	998,736	18,752,112	997,761	.....	.....	4,290	975	.....	.....	.....	.....	.....
British India.....	296,807	3,832,365	277,034	127,966	10,374	43,873	3,715	4,519	.....	.....	.....	1,165
Japan.....	83,696	32,175	4,010	146,177	8,255	15,093	3,049	26,541	126	10	.....	41,831
Hongkong.....	211,802	189,989	36,238	.....	.....	412,011	50,578	62,425	.....	.....	59,151	3,410
Australasia and Tasmania.....	1,039,426	1,220,033	115,917	218,677	19,636	4,124,185	449,304	217,029	20,438	1,164	4,040	232,336
Philippine Islands.....	836,845	136,119	14,340	14,396	3,883	9,758,902	561,883	177,830	14,581	1,262	.....	77,647
All other Asia and Oceania.....	416,036	325,971	24,736	49,820	4,147	1,711,709	190,661	123,683	600	62	1,124	71,623
Africa:												
British East Africa.....	107,358	792,070	47,624	502,970	30,397	480,900	28,384	70	4,102	273	.....	610
British South Africa.....	209,754	49,621	11,265	1,613	300	50,444	5,514	181,809	.....	.....	214	10,652
All other Africa.....	98,029	526,481	39,448	229,063	20,182	367,153	22,806	10,938	.....	.....	.....	4,655

As shown in Table 12, the total value of exports of cotton goods of domestic manufacture for 1908 amounted to \$25,177,758, of which \$6,930,007 represented the value of unbleached cloths, \$1,529,057, the value of bleached cloths, and \$5,809,019, the value of dyed, colored, or printed cloths. Of the total value of cotton manufactures exported, \$4,600,422 went to

Europe, \$12,865,599, to North and South America, \$7,296,596, to Asia, and the remainder, to Africa. The export of American yarns to the Far East is insignificant, that market being controlled by British India and Japan. China is a large importer of yarns, but took from the United States in 1908 only \$12,852 worth.

The imports of cotton manufactures into the United States for the year ending June 30, 1908, by countries from which imported, are shown in the following table:

TABLE 13.—IMPORTS OF COTTON MANUFACTURES, BY COUNTRIES FROM WHICH IMPORTED, FOR THE YEAR ENDING JUNE 30, 1908.¹

COUNTRY.	Total value.	CLOTHS.						CLOTHING, READY MADE, AND OTHER WEARING APPAREL.	HOSIERY AND KNIT GOODS.	LACES, EMBROIDERIES, ETC.	THREAD, YARN, AND WARPS.		ALL OTHER.			
		Bleached, dyed, or printed.		Not bleached, dyed, nor printed.		Plushes, velvets, velveteens, etc.					Value.	Value.		Value.	Pounds.	Value.
		Square yards.	Value.	Square yards.	Value.	Square yards.	Value.								Value.	Value.
Total.....	\$68,379,781	75,876,055	\$12,079,919	3,609,469	\$344,941	2,764,686	\$1,035,536	\$4,185,344	\$9,032,574	\$33,611,010	7,036,442	\$3,921,111	\$4,169,346			
Europe:																
United Kingdom.....	22,421,517	63,157,205	9,784,013	3,120,211	281,073	1,911,742	668,035	174,057	94,996	6,251,771	5,821,486	3,323,865	1,843,707			
Germany.....	18,036,650	2,737,837	483,499	200,624	23,045	616,184	265,284	2,954,715	8,331,961	4,397,773	829,660	426,965	1,183,408			
France.....	11,669,509	4,222,688	890,366	29,721	6,411	229,307	99,983	842,489	300,049	8,954,147	100,225	45,699	530,365			
Switzerland.....	14,478,092	3,356,219	536,586	240,077	32,419	.....	.....	25,608	263,966	13,209,483	241,513	101,138	303,892	
Belgium.....	635,846	601,467	111,971	.....	.....	.....	.....	58,654	221	845,315	11,308	5,466	114,216
Austria-Hungary.....	280,236	620,340	101,122	2,056	410	5,605	1,169	18,876	158	76,286	.....	.....	82,215	
Italy.....	182,792	102,600	18,464	102	11	10	4	10,977	16	130,425	20,838	11,764	11,131			
Spain.....	84,811	179,123	42,290	.....	.....	.....	.....	22,949	12,858	5,087	.....	.....	1,627
Netherlands.....	17,333	12,404	2,673	.....	.....	1,167	583	707	3	10,558	1,455	903	1,906	
Turkey (including Asiatic Turkey).....	89,552	938	201	.....	.....	.....	.....	2,730	893	83,463	.....	.....	2,265
All other Europe.....	41,678	395	130	.....	.....	.....	.....	4,914	25,364	9,855	39	15	1,400
America:																
Canada.....	20,912	769	117	785	142	20	12	3,527	1,295	1,688	9,594	5,221	8,910			
Mexico.....	28,787	276	36	93	8	3	3	1,071	19	26,024	3	2	1,624			
All other America.....	4,347	14	4	.....	.....	.....	.....	1,179	56	2,712	4	1	395
Asia:																
Japan.....	305,270	872,963	107,616	15,402	1,386	642	460	42,832	575	96,951	297	72	55,378			
China.....	29,028	9,922	697	398	36	.....	.....	16,423	134	5,961	.....	.....	5,777
British India.....	44,036	253	35	.....	.....	.....	.....	769	.....	27,705	.....	.....	15,527
All other countries.....	9,385	592	99	.....	.....	.....	.....	2,867	10	5,806	.....	.....	603

¹ Compiled by the Bureau of Statistics, Department of Commerce and Labor.

According to Table 13, the value of imports of cotton manufactures amounted last year to \$68,379,781, about one-half of which consisted of laces and embroideries. Switzerland leads in the value of laces exported to this country with \$13,209,483, or more than one-third of the total, and is followed by France with \$8,954,147, while Germany and the United Kingdom also contributed largely to this class of

imports. Of the bleached, dyed, or printed cloths imported, 84 per cent came from the United Kingdom, which country also supplied more than three-fourths of the thread, yarn, and warps imported. Practically all of the imports of hosiery and knit goods, amounting in value to \$9,032,574, came from Germany.

The following table shows the yearly exports and imports of cotton manufactures since 1900:

TABLE 14.—VALUE OF EXPORTS AND IMPORTS OF COTTON GOODS, BY COUNTRIES TO WHICH EXPORTED AND FROM WHICH IMPORTED: 1900 TO 1908.¹

COUNTRY.	1908	1907	1906	1905	1904	1903	1902	1901	1900
EXPORTS.									
Total.....	\$25,177,758	\$32,305,412	\$52,944,033	\$49,666,080	\$22,403,713	\$32,216,304	\$32,108,362	\$20,272,418	\$24,003,897
Europe:									
United Kingdom.....	2,487,349	2,274,014	2,042,377	1,446,409	1,352,212	1,269,346	1,458,962	1,744,113	1,256,729
Germany.....	1,140,332	1,185,492	971,647	601,541	1,074,278	1,106,832	601,953	621,814	385,683
All other Europe.....	972,741	965,549	654,353	383,692	336,574	322,508	386,930	371,971	270,229
America:									
Canada.....	3,279,519	3,507,446	3,587,567	3,030,341	3,139,508	3,046,125	2,820,781	2,554,144	2,691,992
Mexico.....	869,244	934,910	821,302	880,074	732,850	597,742	661,721	760,090	955,889
Central America.....	2,363,424	2,636,591	2,260,618	2,052,298	1,741,714	1,251,975	1,114,874	1,271,605	1,176,142
British West Indies (including Bermuda).....	687,311	836,047	713,885	659,382	486,027	763,620	619,647	456,395	435,949
Cuba.....	1,585,376	1,608,653	1,507,473	1,330,260	684,212	416,970	378,081	386,037	612,252
Haiti.....	742,978	617,659	822,815	524,800	484,960	572,077	627,040	744,424	745,653
Other North America.....	577,516	828,737	432,468	650,342	557,809	582,090	420,369	443,472	500,290
Brazil.....	373,545	548,367	636,374	823,120	786,860	686,640	607,535	373,748	436,118
Chile.....	616,814	989,059	898,155	764,468	694,594	613,835	439,293	666,196	531,311
Colombia.....	624,687	874,813	698,021	890,143	943,487	1,484,261	810,661	890,167	310,930
Peru.....	132,409	155,792	112,797	157,202	162,785	124,411	103,519	123,090	118,632
Venezuela.....	319,937	439,160	439,645	438,094	547,080	499,603	500,857	903,862	338,294
Other South America.....	692,939	843,830	902,684	1,105,447	564,586	598,481	609,585	364,431	355,556
Asia:									
China.....	3,413,248	5,955,331	29,814,075	28,017,190	4,139,000	13,719,413	16,494,248	4,620,998	8,804,778
British East Indies.....	296,807	654,990	655,346	486,843	453,721	720,826	577,724	436,069	524,419
British Australasia.....	1,039,426	1,229,627	1,385,085	1,079,179	807,269	848,575	918,688	694,435	622,243
Other Asia and Oceania.....	711,534	813,339	1,862,092	1,761,726	421,561	353,707	1,436,843	1,451,723	1,838,326
Aden.....	998,735	1,995,713	1,634,134	1,140,875	1,435,764	1,634,620	(3)	(3)	(3)
Philippine Islands.....	836,845	1,646,874	403,896	850,244	322,259	316,570	(3)	(3)	(3)
All other countries.....	415,141	733,419	782,224	586,350	535,073	681,077	508,005	380,926	455,909
							11,046	12,768	458,438
IMPORTS.									
Total.....	68,379,781	73,704,636	63,043,322	48,919,936	49,524,246	52,462,755	44,460,126	40,246,935	41,296,239
Europe:									
United Kingdom.....	22,421,517	22,971,167	19,446,227	15,089,333	16,831,493	18,685,784	16,376,611	14,299,999	17,110,688
Germany.....	18,036,650	18,212,531	16,459,615	14,332,763	14,156,596	14,136,286	11,071,974	10,291,398	8,863,297
France.....	11,669,509	15,309,399	13,038,125	8,701,625	7,996,644	8,529,531	7,440,592	6,383,710	5,623,340
Switzerland.....	14,478,092	15,286,363	12,578,536	9,728,717	9,526,442	10,095,362	8,716,253	8,493,022	8,975,680
Belgium.....	635,846	591,576	458,557	354,214	305,001	301,578	254,753	260,690	321,863
Austria-Hungary.....	280,236	293,965	218,974	113,833	162,655	157,771	119,773	117,870	107,128
Italy.....	182,792	237,965	97,520	41,281	58,922	57,460	37,673	14,677	10,993
Spain.....	84,811	62,252	86,952	57,400	57,753	54,899	55,572	633	2,747
Netherlands.....	17,333	85,325	60,116	48,880	26,223	27,690	8,808	3,225	11,417
Turkey (including Asiatic Turkey).....	89,552	69,637	43,725	42,796	48,033	67,724	54,238	73,063	68,355
All other Europe.....	41,678	65,704	72,600	34,072	39,112	92,815	16,636	5,826	8,217
America:									
Canada.....	20,912	48,496	10,467	19,429	11,485	8,782	14,997	9,953	6,527
Mexico.....	28,787	40,720	39,110	44,154	52,062	44,024	46,590	43,566	33,828
All other America.....	4,347	4,966	2,074	2,465	1,774	1,774	2,079	4,348	1,460
Asia:									
Japan.....	305,270	333,881	316,278	202,736	181,286	143,234	153,876	135,488	71,066
China.....	29,028	21,853	14,657	25,618	24,199	14,663	20,967	18,492	25,073
British India.....	44,036	43,311	67,872	50,441	23,375	27,626	51,603	65,472	47,742
All other countries.....	9,385	25,525	31,917	30,179	22,663	15,752	17,131	25,503	8,418

¹ Compiled by the Bureau of Statistics, Department of Commerce and Labor.

² Includes exports to Japan in 1906, valued at \$393,628, and in 1905, valued at \$1,430,710.

³ Included in "other Asia and Oceania."

⁴ Includes value of exports to Hawaii.

As indicated in Table 14, the annual exports of cotton manufactures are subject to very wide fluctuations, those for 1908 amounting to \$25,177,758, or less than one-half of those for 1906, when they amounted to \$52,944,033. This reduction is due entirely to the falling off in the exports to China, which dropped from \$29,814,075 in 1906 to \$3,413,248 in 1908, and strik-

ingly illustrates the necessity for a wider range of markets for American manufactures.

The value of imports of cotton goods increased from \$41,296,239 in 1900 to \$68,379,781 in 1908. Practically all of this increase is due to the importation of hosiery and other knit goods from Germany and laces and embroideries from Switzerland and France.

The following table will be found an interesting reference in connection with the cotton industry and trade of the United States, as it shows the production, net weight of bale, value of lint per pound, domestic exports, consumption, and net imports of cotton, 1790 to 1907.

TABLE 15.—PRODUCTION, CONSUMPTION, EXPORTS, AND IMPORTS OF COTTON FOR THE UNITED STATES: 1790 TO 1907.

YEAR.	PRODUCTION.				Consumption (500-pound bales).	Exports of domestic cotton (500-pound bales).	Net imports (500-pound bales).	YEAR.	PRODUCTION.				Consumption (500-pound bales).	Exports of domestic cotton (500-pound bales).	Net imports (500-pound bales).
	Running bales, counting round as half bales (number).	Equivalent 500-pound bales, gross weight (number).	Average net weight of bale (lbs.).	Value of lint per pound, upland cotton (cents).					Running bales, counting round as half bales (number).	Equivalent 500-pound bales, gross weight (number).	Average net weight of bale (lbs.).	Value of lint per pound, upland cotton (cents).			
1907....	11,325,882	11,375,461	480	11.5	4,403,028	7,779,508	140,869	1847...	2,439,786	2,128,433	417	8.0	537,427	1,628,549	558
1906....	13,305,265	13,595,493	490	10.0	4,974,199	8,325,237	202,733	1846....	1,778,651	1,603,763	431	11.2	385,916	1,054,440	122
1905....	10,725,602	10,804,550	482	10.9	4,877,465	6,975,494	133,464	1845....	2,100,537	1,806,110	411	7.9	383,365	1,095,116	386
1904....	13,697,310	13,679,954	478	8.7	4,623,208	9,119,614	130,182	1844....	2,394,503	2,078,910	415	5.6	337,730	1,745,812	2,680
1903....	10,015,721	7,433,615	480	12.2	3,980,567	6,290,245	100,288	1843....	2,030,409	1,750,060	412	7.7	298,872	1,327,287	517
1902....	10,784,473	10,827,168	481	8.2	4,187,076	6,960,880	149,113	1842....	2,378,875	2,035,481	409	7.2	278,108	1,584,594	1,835
1901....	9,748,546	9,675,771	489	8.1	4,080,287	6,928,697	190,080	1841....	1,683,574	1,398,282	397	7.8	222,461	1,169,434	107
1900....	10,245,602	10,266,527	480	9.3	3,603,516	6,800,917	116,610	1840....	1,634,954	1,347,640	394	9.5	245,045	1,060,408	1,210
1899....	9,507,786	9,459,935	476	7.6	3,687,253	6,221,541	134,778	1839....	2,063,915	1,653,722	383	8.9	236,525	1,487,882	297
1898....	11,189,205	11,435,388	489	4.9	3,672,097	7,655,281	103,223	1838....	1,360,532	1,092,980	384	13.4	221,738	827,248	319
1897....	10,897,857	10,985,040	482	5.6	3,472,393	7,839,467	105,802	1837....	1,801,497	1,428,384	379	10.1	195,100	1,191,005	355
1896....	8,532,705	8,515,640	477	7.3	2,841,394	6,120,185	114,712	1836....	1,423,930	1,129,016	379	13.2	176,449	888,423	2,510
1895....	7,161,094	7,146,772	477	8.2	2,499,731	4,761,505	112,001	1835....	1,360,725	1,061,821	373	16.5	184,731	847,263	427
1894....	9,901,251	10,025,534	484	5.9	2,983,665	6,961,372	99,399	1834....	1,253,406	962,343	367	17.4	166,523	774,718	1,574
1893....	7,493,000	7,433,056	474	7.5	2,300,276	5,307,295	59,405	1833....	1,225,895	930,962	363	12.9	149,159	709,436	308
1892....	6,700,365	6,658,313	475	8.4	2,415,875	4,485,251	85,735	1832....	1,114,286	815,900	350	12.3	142,352	649,397	69
1891....	9,035,379	8,940,867	473	7.3	2,846,753	5,896,800	64,394	1831....	1,069,444	805,439	360	9.4	130,895	644,430	2,222
1890....	8,862,597	8,562,089	473	8.6	2,604,491	5,850,219	45,880	1830....	1,026,393	732,218	341	9.7	129,938	653,900	22
1889....	7,472,511	7,472,511	478	11.5	2,518,409	4,928,921	18,334	1829....	1,070,696	763,598	339	10.0	89,723	596,918	378
1888....	6,938,290	6,923,775	477	10.7	2,309,250	4,730,192	15,284	1828....	953,079	679,916	341	9.9	84,788	529,074	2,40
1887....	7,046,833	6,884,667	467	10.3	2,205,302	4,519,254	11,983	1827....	805,970	564,854	335	10.3	84,516	421,181	597
1886....	6,505,087	6,314,561	464	10.3	2,049,687	4,301,542	7,652	1826....	1,057,402	732,218	331	9.3	103,535	588,620	74
1885....	6,575,691	6,369,341	463	9.4	2,094,632	4,200,647	3,270	1825....	817,308	533,473	312	12.2	409,071	429,071	79
1884....	5,682,000	5,477,448	460	10.5	1,687,108	3,730,170	7,144	1824....	751,748	449,791	286	18.6	352,900	396,918	26
1883....	5,713,200	5,521,963	462	10.6	1,813,865	3,733,369	11,247	1823....	656,028	387,029	282	14.7	286,739	352,900	932
1882....	6,949,756	6,833,442	470	10.6	2,038,400	4,591,331	4,716	1822....	704,698	439,331	298	11.4	347,447	347,447	110
1881....	5,456,048	5,136,447	450	12.2	1,849,457	3,376,521	3,261	1821....	536,042	376,569	283	14.3	289,350	289,350	1,196
1880....	6,605,750	6,356,998	460	11.3	1,865,922	4,453,495	5,447	1820....	575,540	334,728	278	14.3	100,000	249,787	427
1879....	5,755,359	5,466,387	454	12.0	1,500,688	3,742,752	7,678	1819....	632,576	349,372	264	17.0	255,720	255,720	2,457
1878....	5,074,155	4,745,078	447	10.8	1,457,266	3,290,167	5,049	1818....	446,229	261,506	280	24.0	175,994	175,994	2,454
1877....	4,773,865	4,494,224	450	11.3	1,458,667	3,197,439	5,046	1817....	465,950	271,967	279	34.0	184,942	184,942	3,086
1876....	4,474,069	4,118,390	440	11.7	1,314,489	2,839,418	4,832	1816....	439,716	259,414	282	26.0	171,299	171,299	2,048
1875....	4,632,313	4,302,818	444	13.0	1,255,712	3,037,650	4,498	1815....	369,004	209,205	271	29.0	163,894	163,894	2,44
1874....	3,832,991	3,528,276	440	15.0	1,098,163	2,504,118	3,784	1814....	254,545	146,444	275	21.0	51,778	165,997	2,666
1873....	4,170,388	3,873,750	444	17.0	1,213,052	2,632,631	3,541	1813....	304,878	156,904	246	15.5	35,458	35,458	101
1872....	3,930,508	3,650,932	444	18.2	1,115,691	2,470,590	10,016	1812....	304,878	156,904	246	12.5	38,220	38,220	3,133
1871....	2,974,351	2,756,564	443	20.5	1,146,730	1,824,937	6,374	1811....	325,203	167,364	246	10.5	57,775	57,775	897
1870....	4,352,317	4,024,527	442	17.0	1,028,583	2,922,757	1,802	1810....	286,195	177,824	297	15.5	35,565	124,116	431
1869....	3,011,996	2,409,597	440	24.0	796,616	1,987,708	3,025	1809....	328,000	171,548	250	16.0	33,473	186,523	2,560
1868....	2,366,467	2,198,141	444	29.0	860,481	1,300,449	1,870	1808....	334,821	156,904	224	16.0	101,981	101,981	2,160
1867....	2,519,554	2,345,610	445	24.9	844,044	1,502,756	345	1807....	289,855	167,364	276	19.0	21,261	21,261	6,297
1866....	2,097,254	1,948,077	444	31.6	715,258	1,401,097	1,035	1806....	285,714	167,364	280	21.5	127,889	127,889	1,485
1865....	2,269,316	2,093,658	441	43.2	614,540	1,301,146	10,322	1805....	304,348	146,444	230	22.0	71,315	71,315	961
1864....	3,000,000	299,372	477	83.4	344,278	17,789	68,798	1804....	261,044	135,983	249	23.0	23,013	76,780	456
1863....	450,000	449,059	477	101.5	219,540	23,988	2,988	1803....	222,222	125,523	270	20.0	70,068	70,068	183
1862....	1,600,000	1,596,653	477	67.2	287,397	22,770	67,695	1802....	231,092	115,063	238	19.0	75,424	75,424	2,153
1861....	4,500,000	4,490,586	477	31.3	369,226	10,129	61,731	1801....	210,526	100,418	228	19.0	47,768	47,768	2,170
1860....	3,849,469	3,841,416	477	13.0	841,975	615,032	5,032	1800....	153,609	73,222	228	44.0	18,829	41,822	8,696
1859....	5,387,052	4,309,642	461	11.0	845,410	3,535,373	3,535	1799....	88,889	41,841	225	28.0	16,737	35,580	8,370
1858....	4,018,914	3,758,273	447	12.1	867,489	2,772,937	2,772	1798....	66,667	31,381	225	44.0	19,055	19,055	7,532
1857....	3,257,339	3,012,016	442	12.2	550,708	2,237,248	2,237	1797....	48,889	23,013	225	39.0	18,720	18,720	7,761
1856....	3,093,737	2,873,680	444	13.5	761,614	2,096,565	1,678	1796....	44,444	20,921	225	34.0	7,577	7,577	7,336
1855....	3,665,557	3,220,782	420	10.3	731,484	2,702,863	2,295	1795....	35,566	16,736	225	36.5	12,213	12,213	8,737
1854....	2,982,634	2,708,082	434	10.4	641,391	2,016,849	4,425	1794....	35,566	16,736	225	36.5	9,414	9,414	8,592
1853....	3,074,979	2,766,194	430	11.0	663,204	1,975,666	1,141	1793....	22,222	10,460	225	33.0	3,565	3,565	5,127
1852....	3,416,214	3,130,338	438	11.0	736,468	2,223,141	1,423	1792....	13,333	6,276	225	32.0	1,097	1,097	5,503
1851....	3,126,310	2,799,290	428	9.5	617,468	2,186,461	380	1791....	8,889	4,184	225	29.0	277	277	1,112
1850....	2,454,442	2,136,083	416	12.1	422,626	1,854,474	485	1790....	6,667	3,138	225	26.0	11,000	11,000	697
1849....	2,469,093	1,975,274	429	12.3	575,506	1,270,763	485								
1848....	2,566,988	2,615,031	436	7.5	586,032	2,053,294	22								

WORLD'S CONSUMPTION OF COTTON, AND TRADE IN COTTON AND ITS MANUFACTURES FOR SELECTED COUNTRIES.

Statistics of the number of cotton spindles and of the mill consumption of cotton throughout the world in 1900 and 1908 are shown in the following table:

TABLE 16.—World's cotton spindles and mill consumption, by countries, 1908 and 1900.¹

COUNTRY.	COTTON SPINDLES (NUMBER).		MILL CONSUMPTION (BALES). ²	
	1908	1900	1908	1900
Total.....	130,054,408	105,661,232	18,855,519	15,185,165
United States:				
Cotton growing states.....	10,200,903	4,367,688	2,120,581	1,523,168
All other states.....	17,304,519	15,104,544	2,372,447	2,349,997
Europe:				
United Kingdom.....	52,817,582	45,500,000	3,842,000	3,330,000
Germany.....	9,882,505	8,000,000	1,793,000	1,400,000
Russia.....	7,855,210	7,500,000	1,494,000	1,350,000
France.....	6,731,316	5,500,000	950,000	700,000
Italy.....	4,181,000	1,940,000	1,027,000	475,000
Austria-Hungary.....	4,026,460	3,300,000	740,000	675,000
Spain.....	1,850,000	2,015,000	343,000	400,000
Switzerland.....	1,493,012	1,550,000	95,000	125,000
Belgium.....	1,162,041	920,000	212,300	170,000
Portugal.....	450,000	230,000	81,000	60,000
Netherlands.....	396,160	300,000	77,326	70,000
Sweden.....	390,000	360,000	69,000	65,000
Denmark.....	77,644	40,000	20,794	15,000
Norway.....	74,936	35,000	11,255	10,000
All other Europe.....	185,000	110,000	80,000	50,000
British India.....	5,609,898	4,945,000	1,548,638	1,162,000
Japan.....	1,550,929	1,274,000	878,178	700,000
China.....	750,000	550,000	375,000	200,000
Brazil.....	1,300,000	450,000	375,000	85,000
Mexico.....	730,000	470,000	175,000	125,000
Canada.....	795,293	550,000	115,000	110,000
Other countries.....	150,000	50,000	40,000	15,000

¹ The statistics for the United States were collected by this Bureau. Those for other countries have been compiled from a number of authorities, among them being the reports of the International Federation of Master Cotton Spinners' and Manufacturers' Associations, Manchester; the Financial and Commercial Chronicle, and Cotton Facts, New York; Lyon & Co., and Bombay Cotton Trade Association, Bombay; and Mitsui Bussan Kaisha, Osaka.

² The statistics for the United States, Russia, British India, Japan, and Brazil represent bales of 500 pounds each.

The statistics for the European countries shown in Table 16 are those published by the International Federation of Master Cotton Spinners' and Manufacturers' Associations. The Federation secured returns from mills having 80,292,650 spindles which consumed this year 9,582,241 bales of cotton. The number of spindles in the mills which did not report has been calculated by the Federation at 12,648,009, making a total for the countries named in the report of 92,940,659 spindles; the quantity of cotton consumed by the unreported establishments is computed at 1,947,722 running bales, making a total consumption for the countries shown of 11,529,963 bales. The Federation fixes the stocks held by the manufacturers in the countries mentioned in the report at 2,207,558 bales, which is nearly one-fifth of the quantity of cotton consumed in these countries during the year.

The following statement contains the report of the Federation as regards spindles, consumption, and stocks except for the United States, British India, Japan, Brazil, and China, for which countries the Census Bureau secured complete reports direct. The statistics of consumption and stocks in the statement are in running bales; those for American cotton being expressed in bales of about 500 pounds; East Indian, 400 pounds; Egyptian, 700 pounds; Russian, about 280 pounds; and an average for the other countries of about 300 pounds.

Report of the International Federation of Master Cotton Spinners' and Manufacturers' Associations regarding spindles, consumption, and stocks of cotton in the countries named, for the year ending August 31, 1908.

COUNTRY.	Total spinning spindles (number). ¹	SPINNING SPINDLES (ACTUAL RETURNS).			Spinning spindles reporting short time.	CONSUMPTION.					STOCKS AUGUST 31, 1908.				
		Total (number).	Mule (number).	Ring (number).		Total (bales).	American (bales).	East Indian (bales).	Egyptian (bales).	Sundries (bales).	Total (bales).	American (bales).	East Indian (bales).	Egyptian (bales).	Sundries (bales).
Total.....	92,940,659	80,292,650	56,669,315	23,623,335	45,131,635	11,529,963	7,861,685	1,333,033	757,538	1,577,707	2,207,558	1,071,527	526,098	182,683	427,250
Great Britain.....	52,817,582	46,064,236	33,996,741	7,667,495	32,197,712	3,841,981	3,272,075	76,058	396,135	97,713	411,977	296,835	21,655	72,888	20,599
Germany.....	9,882,505	9,691,905	5,405,406	4,286,499	9,191,900	1,793,180	1,247,468	407,950	100,703	37,059	342,725	153,574	160,097	21,445	7,009
Russia.....	7,855,210	3,691,267	1,854,265	1,837,002	930,259	930,259	740,512	127,356	58,495	23,896	164,646	88,112	54,254	14,539	7,741
France.....	6,731,316	6,232,700	3,744,762	2,487,938	1,182,205	739,941	467,230	234,702	27,822	10,187	224,754	100,540	110,163	12,079	1,972
Italy.....	4,181,000	3,559,069	947,292	2,611,777	29,902	1,027,188	702,569	283,263	23,246	18,020	257,798	136,509	109,165	7,233	4,891
Austria.....	4,026,460	3,996,460	2,437,653	1,558,807	.....	94,955	59,735	5,136	28,173	1,911	20,244	9,152	1,627	8,002	1,463
Spain.....	1,850,000	1,660,000	664,658	995,342	100,000	212,374	116,878	93,939	848	709	45,179	13,712	30,887	371	209
Switzerland.....	1,493,012	1,439,000	1,231,328	207,732	65,274	343,045	245,976	50,838	19,665	26,566	22,099	11,544	4,662	2,775	3,718
Belgium.....	1,162,041	1,162,041	598,905	563,135	882,775	81,085	54,342	229	1,084	25,430	13,593	8,374	.....	112	5,107
Portugal.....	450,000	370,407	123,469	246,938	370,407	1,964,352	667,064	18,617	98,033	1,180,638	600,138	206,513	15,318	42,575	335,732
Holland.....	396,160	396,160	185,582	210,578	42,000	77,326	57,876	18,710	.....	740	18,679	7,460	11,187	.....	32
Sweden.....	390,000	319,889	100,522	219,357	228,672	88,857	77,368	11,224	.....	265	18,950	12,956	5,951	.....	43
Denmark.....	77,644	77,644	13,376	64,268	58,308	11,255	10,301	888	.....	66	1,839	1,337	440	.....	61
Norway.....	74,936	74,936	21,748	53,188	39,720	20,794	17,081	3,466	.....	247	1,483	740	692	.....	52
Canada.....	795,293	729,724	335,526	394,198	719,724	3,000	.....	3,000	.....	250	.....	.....	.....	250	.....
Mexico.....	730,000	199,652	8,072	191,580	15,636	114,920	114,586	334	.....	23,167	22,753	.....	414	.....	.....
Egypt.....	20,000	20,000	.....	20,000	.....	162,951	9,534	657	.....	152,760	39,215	1,416	.....	.....	37,799
Argentina.....	7,500	7,500	.....	7,500	7,500	2,500	1,000	.....	.....	1,500	222	.....	.....	.....	222

¹ The number of spindles over those in the "actual returns" has been arrived at by a careful addition of the spindles of the firms which have not sent in returns, and for this purpose the most reliable textile directories have been consulted.

In addition to the statistics of stocks shown in this abridged statement the Association reports the manufacturers of India held 515,000 bales, those of Brazil 65,000 bales, and those of Japan 261,000 bales.

It must be kept in mind that the total consumption of cotton is not shown in Table 16, as considerable quantities of the fiber, grown and consumed in several eastern countries and in South and Central America, do not enter into commercial channels and can not, therefore, be estimated with any certainty.

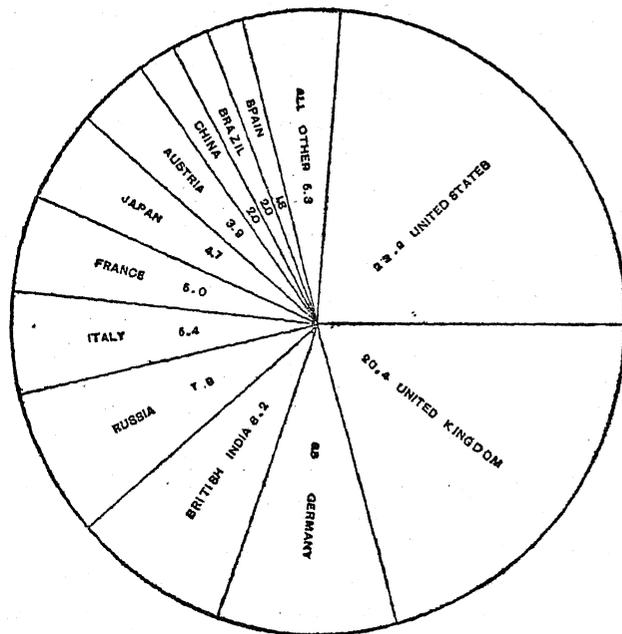
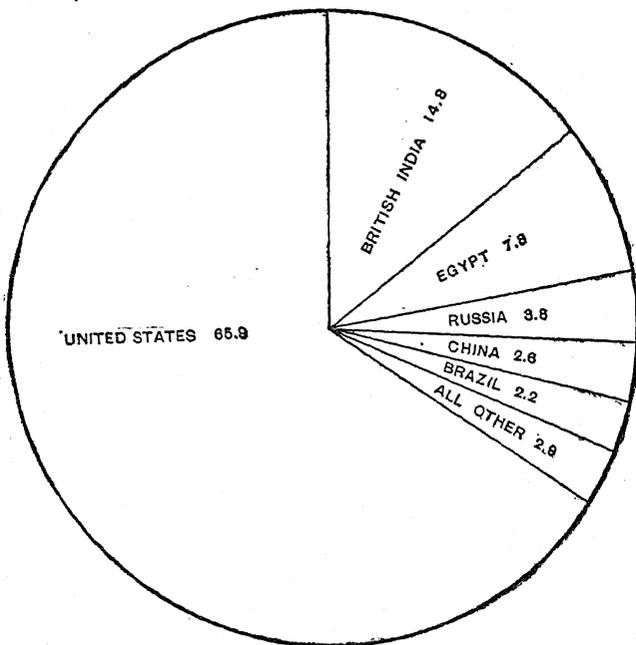
According to the table, the number of cotton spindles in the world at the present time is 130,054,408, compared with 105,661,232 in 1900, an increase during the eight years of 23.1 per cent. The quantity of cotton consumed during this period increased from 15,185,165 bales to 18,855,519 bales, or 24.2 per cent.

The relative importance of the several countries in the production and consumption of cotton is interestingly presented by the following diagram:

DIAGRAM 3.—RELATIVE IMPORTANCE OF THE SEVERAL COUNTRIES IN THE PRODUCTION AND CONSUMPTION OF COTTON.

Proportion of world's mill supply of cotton contributed by each country: 1908. (Growth of 1907.)

Proportion of world's mill supply consumed by each country: 1908. (Year ending August 31.)



The production of cotton for mill consumption in 1907 was, according to Census Bulletin 95, 16,512,185 bales, whereas the consumption during the year ending August 31, 1908, was 18,855,519 bales, indicating that the year's growth was inadequate for the requirements of the year by about 2,340,000 bales. This shortage was made good by drawing from accumulated stocks. The fluctuations in the world's supply of cotton are measured practically by the variations in the annual production in the United States, as this country furnishes about two-thirds of the total supply. It is a proper inference and, indeed, a significant fact that notwithstanding the large amount of "short time" in the industry during this year, the world's consumption of American cotton has amounted to approximately 12,500,000 bales, whereas the production in this country in 1907 was about 11,000,000 bales of 500 pounds each, net weight. Now, if the consumption of cotton during the year ending August 31, 1909, should be equal to that of 1908, to prevent a further decrease in stocks the United States must contribute

at least 12,500,000 bales. Moreover, the consumption of cotton in the world during 1908, because of the large amount of "short time," represents probably not more than four-fifths of the maximum capacity of the mills and, if this be true, the potential consumption is not less than 21,000,000 bales. Perfect conditions for the industry, however, will hardly prevail throughout all of the countries in any one year, but under "normal" conditions it would appear that the consumption might be conservatively estimated at 20,000,000 bales. The share of this which the United States would be expected to contribute is approximately 13,300,000 bales.

The financial disturbance in the fall of 1907 had a far-reaching influence upon the industry, beginning with the manufacturer, who first felt the tendency to curtail expenditures beyond absolute necessity, and slowly but surely working its way down to the spinner, thence to those interested in the sale and the distribution of the raw material. The market for cotton goods during the last six months of the season was ir

a condition of oversupply in spite of the considerable amount of "short time" that had been worked, and producers were consequently at a disadvantage in selling the output of their mills.

While these conditions prevailed during the latter portion of the season in practically all of the manufacturing countries, they were especially marked in the United Kingdom and Germany, where there was considerable curtailment of production. Following upon the financial depression, a crisis of labor troubles occurred in Manchester in December last, brought about through the demand of the ring spinners for an advance in wages on the ground that they were paid on a lower scale than mule spinners. It now appears that a satisfactory adjustment of the matter is in sight, and the general conditions seem to justify the hope that the worst is passed and that there will be fewer hardships to contend with in the industry during the ensuing year.

One of the particularly disappointing features of the depression in the industry for the season has been the decline in the volume of the export trade of cotton goods for the United States, as the outward movement in all directions, especially to the Orient, shows a decrease. The situation, however, as regards the East is not, it is believed, as unsatisfactory as statistics would appear to indicate. The importation of cotton goods into China in 1904 and 1905 from both Europe and America was very much in excess of immediate demands, and because of this stocks there are now relatively large. It may be pointed out that while stocks of some classes of goods are somewhat in excess in China, the situation for staple lines is not bad and that at some points the stocks of American goods have run down to small proportions, which seems to encourage hope of the revival of American export trade in the near future.

UNITED KINGDOM.

As shown in Table 16, there are now 52,817,582 spindles in the United Kingdom, compared with 45,500,000 in 1900, an increase in the eight years of 16 per cent. While the number of spindles in the United Kingdom is 40 per cent of the total for the world, the quantity of cotton consumed last year is only 20 per cent of the total. The explanation of this condition is found in the fact that the mills of that country manufacture much finer goods and consume less cotton per spindle than those in other countries.

Of the supply of cotton for the mills of Great Britain, about 75 per cent is contributed by the United States, the other countries represented in furnishing the supply being Egypt, with 18 per cent; British India, with 4 per cent; and Brazil, with 3 per cent. A considerable portion of the cotton imported into the

United Kingdom is for transshipment to other countries, a condition brought about by the excellent shipping facilities of the country.

The recent labor troubles in the Manchester district appear to be in course of settlement, and in some respects the strike will prove of advantage to the manufacturers, for many of the companies had their warehouses filled with manufactured goods which the market would not absorb. This respite from full operations have afforded opportunity to lessen the store of goods, to overhaul machinery, and to avoid the pay roll while waiting for the market to improve. All of the mills worked during the last few months on "short time," but very few actually shut down during the strike and period of financial depression. They continued to pile up goods rather than to discharge their employees. To reduce expenses furloughs were frequently given where more than one member of the same family was on the pay roll. The actual time operated averaged about 45 hours a week, compared with the normal running time of 55½ hours; some of the mills found it more convenient to run full time for a week and then stop entirely for one week.

CONTINENTAL EUROPE.

Germany.—Measured by the number of spindles and by the quantity of cotton consumed, Germany leads the countries of continental Europe in this form of manufacture, and is surpassed only by the United Kingdom and the United States. According to Table 16, the number of cotton spindles in Germany increased from 8,000,000 in 1900 to 9,882,505 in 1908, or 24 per cent; the increase indicated in the consumption of cotton is 394,000 bales, or 28 per cent, in the eight years. About two-thirds of the country's cotton supply is secured from the United States, while practically all of the remainder is imported from British India and Egypt. Raw cotton is the largest single import of Germany and manufactured cotton the largest export. There are in the country 21 towns, each of which contains manufacturing establishments having a total of more than 100,000 spindles, representing in the aggregate more than one-half of the total number of cotton spindles in Germany. A distribution of spindles and looms for these 21 communities is as follows:¹

TOWN.	Spindles (number).	Looms (number).	TOWN.	Spindles (number).	Looms (number).
Mulhausen.....	520,300	8,797	Bocholt.....	197,220	7,838
Augsburg.....	509,076	9,630	Chemnitz.....	165,900	1,897
Gronau.....	494,234	1,055	Mittweida.....	162,000	1,761
Rheine.....	400,728	5,175	Logelbach.....	146,908	3,253
Rheydt.....	345,113	4,421	Crimmitschau.....	142,560	.....
Hof.....	325,136	3,169	Bairreuth.....	141,032	758
Werdau.....	304,000	.....	Bamberg.....	125,000	2,186
München Gladbach.....	273,478	8,493	Falkenau.....	107,000	.....
Gebweiler.....	210,132	2,027	Kempten.....	106,808	2,489
Leipzig.....	206,000	.....	Plautz.....	105,000	.....
			Mulfort.....	100,446	.....

¹Bureau of Manufactures, Department of Commerce and Labor, Daily Consular and Trade Reports.

Germany is the second largest importer of cotton and exporter of cotton goods in the world; last year, according to Table 17, this country imported 2,221,419 bales of cotton and exported 237,047 bales. During the same period the value of the imports and exports of cotton goods amounted to \$49,512,092 and \$108,156,482, respectively.

France.—As indicated in Table 16, there are at the present time 6,731,316 spindles in France, compared with 5,500,000 in 1900, an increase of 22 per cent in the eight years. The consumption of cotton during this period has increased from 700,000 bales to 950,000 bales, or 36 per cent. The industry is concentrated mainly in the northern and eastern provinces, particularly in and about the cities of Lille, Arras, Tourcoing, and Roubaix. As shown in Table 17, France imported for home consumption in 1907 cotton goods to the value of \$17,887,240; in addition, goods valued at more than \$20,000,000 were imported for reshipment to other countries, the most of which went to the French colonies. France ranks third in exports of cotton goods, which last year amounted in value to \$62,954,284. During the same time the country imported 1,284,554 bales of raw cotton and exported 257,318 bales. About two-thirds of the cotton imported is American, although considerable quantities of Indian and other short fiber cotton are also imported. The manufacturers of fine goods in and about Lille use also a great deal of Egyptian cotton.

Russia.—In view of the frequent and continued political disturbances, the development of the cotton manufacturing industry in Russia during the last eight years is interesting. The number of spindles, according to Table 16, increased from 7,500,000 in 1900 to 7,855,210 in 1908, or 5 per cent, and the quantity of cotton consumed from 1,350,000 bales to 1,494,000 bales, or 11 per cent. The present condition of the industry in this country is more satisfactory than in many other European countries.

Cotton is imported into Russia direct from a number of countries, while large quantities are reshipped from the United Kingdom and Germany. The total imports of raw cotton in 1906 amounted to 745,584 bales. Practically all of the cotton exported from Persia comes to Russia, where factories have been specially equipped for spinning it. In addition to the cotton imported, large quantities grown in Asiatic Russia are consumed in the Russian mills.

Austria-Hungary.—There are in Austria-Hungary to-day 4,026,460 spindles, compared with 3,300,000 eight years ago, an increase of 21 per cent; the quantity of cotton consumed during this period increased from 675,000 bales to 740,000 bales, or 10 per cent. Last year 890,120 bales of cotton were imported. About two-thirds of this supply comes from the

United States and practically all of the remainder from India. The development of the textile industry in Austria-Hungary since 1900 has been remarkable. Not until very recent years has this country been able to supply its own demand, and it is, therefore, noteworthy that its exports of cotton manufactures in 1907 amounted in value to \$20,688,909, more than one-half being sent to Turkey and the Balkan states.

Belgium.—There are in Belgium at this time 1,162,041 spindles, compared with 920,000 in 1900, an increase during the eight years of 242,041 spindles, or 26 per cent. The consumption of cotton increased during this period from 170,000 bales to 212,300 bales, or 25 per cent. According to Table 17 this country imported last year 630,015 bales of cotton and exported 355,555 bales. The imports and exports of cotton goods were almost equal; the value of the former amounted to \$53,117,812, while the latter represented a value of \$57,069,622.

Italy.—Probably the most interesting development in the cotton manufacturing industry in any of the European countries during the period covered by Table 16 is that in Italy, where the number of spindles increased from 1,940,000 in 1900 to 4,181,000 in 1908, and the quantity of cotton consumed from 475,000 bales to 1,027,000 bales. In 1907 Italy imported 961,302 bales of cotton and exported 32,211 bales, while the value of the imports of cotton goods amounted to \$6,977,171 and of the exports to \$24,643,156. This country relies upon America and India for its cotton supply.

Other European countries.—In addition to the European countries already named, the manufacture of cotton is an important industry in a number of others, chief of which are Spain, Switzerland, Portugal, the Netherlands, Norway, Sweden, and Denmark. The statistics for these, as well as for several other countries, are included in Table 16. The present condition of the industry in these countries is practically the same as in the countries reviewed.

BRITISH INDIA.

According to the statistics of Table 16, the number of spindles in the mills of British India increased from 4,945,000 in 1900 to 5,699,898 in 1908, or 15 per cent, and the quantity of cotton consumed from 1,162,000 bales to 1,548,638 bales, or 33 per cent. These statistics give the country sixth place in cotton manufacturing. Of the total supply of cotton for mill consumption for the year ending June 30, 1908, amounting to 2,148,638 bales of 500 pounds each, only 44,057 bales were of foreign growth. In addition to the quantity of cotton consumed in the mills it is estimated that about 600,000 bales were consumed in the homes of the people. The cotton

imported into India is used mainly for the spinning of finer counts than is possible with native cotton. The exports of cotton amounted to 1,497,960 bales, and the quantity of stocks in the country on hand June 30, 1908, amounted to 602,759 bales.¹

JAPAN.

As indicated by the statistics of Table 16, the number of cotton spindles in Japan at the present time is 1,550,929, compared with 1,274,000 in 1900, and the quantity of cotton consumed during this period increased from 700,000 bales to 878,178 bales. The large consumption per spindle is probably due to the fact that the spindles are frequently operated day and night and are mostly frame spindles, which consume about 50 per cent more cotton than mule spindles. In addition to the 878,178 bales consumed in the mills, 12,500 bales were consumed elsewhere, while the stocks on hand August 31, 1908, amounted to 429,298 bales. Practically the entire supply of cotton is imported; the production of the country in 1907 amounted to only 10,053 bales. Of the 853,423 bales of cotton imported during the year 333,440 bales were secured from India, 233,375 bales from China, 196,865 bales from the United States, 3,903 bales from Korea, and 85,840 bales from other countries.²

It is noteworthy that the exports of textile machinery from the United Kingdom to Japan are steadily increasing. The value of such exports in 1902 amounted to about \$390,000, compared with \$2,345,000 in 1907. Import duties bar out coarse cotton fabrics and Great Britain has a trade with Japan only for finer cloths and highly finished goods, which, thus far, Japan has not been able to produce.

CHINA.

There are in China 27 cotton spinning power mills, not including the one at Hongkong also engaged in spinning yarns for the market. As indicated in Table 16, the number of spindles has increased from 550,000 in 1900 to 750,000 in 1908, and the quantity of cotton consumed from 200,000 bales to 375,000 bales. These figures refer, of course, to the cotton mills proper and do not include the large quantity of cotton consumed in the homes of the people. Shanghai is the most important cotton manufacturing center, 12 mills with practically one-half of the spindles of the empire being located there. As shown in Table 17, China ranks second in the value of cotton goods imported, being exceeded only by British India.

BRAZIL.

As indicated by the statistics of Table 16, there has been a remarkable development in the cotton

manufacturing industry of Brazil since 1900. The number of spindles at that time was 450,000, compared with 1,300,000 at the present time; the quantity of cotton consumed increased during this period from 85,000 bales to 375,000 bales. The raw material of these mills is home grown and the manufacture, while confined to the coarser and cheaper goods, has a promising future. The exports of raw cotton from Brazil in 1907 amounted to 140,000 bales of 500 pounds each, which was about 40 per cent of the total production. About three-fourths of these exports went to Great Britain.

MEXICO.

It will be observed, by reference to Table 16, that the number of spindles in Mexico increased from 470,000 in 1900 to 730,000 in 1908, while the quantity of cotton consumed increased from 125,000 to 175,000 bales. The higher prices for raw cotton which have prevailed in the United States during the last five years have stimulated the culture of cotton in Mexico. The result is that the country is now producing a larger proportion of its cotton supply, the imports last year amounting to only 2,558 bales. The value of cotton goods imported was \$6,904,893.

CANADA.

The relative importance of the cotton manufacturing industry in Canada is indicated by the statistics of Table 16, which show that the number of spindles has increased from 550,000 in 1900 to 795,293 in 1908, and the quantity of cotton consumed from 110,000 bales to 115,000 bales. The statistics as to the quantity of cotton consumed would seem to indicate that there has been a marked tendency during this period toward the production of finer goods, and hence a decrease in the consumption of cotton per spindle. In 1907 Canada imported 144,761 bales of cotton and cotton goods to the value of \$13,509,196.

OTHER COUNTRIES.

There are a number of other countries of small though increasing importance as manufacturers of cotton goods that must be taken into account in a review of the world's progress in this industry and in reckoning with future requirements for cotton. Among these countries are Asiatic Turkey, Egypt, Indo-China, Argentina, Peru, and Australia. The consumption of cotton in Asiatic Turkey, while not extensive, is increasing yearly. The exports of cotton goods from the United Kingdom alone to Asiatic Turkey in 1906 amounted to \$15,579,885; Smyrna imports annually cotton cloth valued at more than \$1,000,000. The rapidity with which certain grades of Indian yarn have been introduced into the Levant would indicate that American yarn might meet with success in that market. During a portion of 1907

¹ From information furnished by the Bombay Cotton Trade Association (Limited).

² From information furnished by Mitsui Bussan Kaisha, Osaka.

two cotton mills, with 39,200 cotton spindles, were operated in Egypt, but the machinery of one of these has now been removed to Asia Minor. It would seem that the saving in freight and import charges would make the establishment of cotton mills in Egypt profitable, but scarcity of efficient labor and an excise

tax of 8 per cent on cotton manufactures have been instrumental in keeping the industry from expanding there.

The following table, showing the statistics of the trade in cotton and cotton goods for selected countries, may be of interest:

TABLE 17.—IMPORTS AND EXPORTS OF RAW COTTON AND OF COTTON MANUFACTURES FOR SELECTED COUNTRIES.¹

COUNTRY.	Year.	Cotton (500-pound bales).	VALUE OF COTTON MANUFACTURES.			
			Total.	Cloth.	Yarn and thread.	All other.
IMPORTS.						
Austria-Hungary.....	1907	890,120	\$15,811,003	\$1,861,474	\$8,500,028	\$5,449,501
Belgium.....	1907	630,015	53,117,812	20,277,188	9,921,229	22,919,395
Bulgaria.....	1907	5,457	4,765,556	2,371,633	1,723,892	670,011
Denmark.....	1907	38,720	7,981,040	5,499,360	1,155,080	1,326,600
France.....	1907	1,284,554	17,887,240	2,261,188	4,791,611	10,834,441
Germany.....	1907	2,221,419	49,512,092	11,071,760	29,302,798	9,137,534
Greece.....	1906	12,775	2,306,570	1,861,920	204,522	180,128
Italy.....	1907	961,302	6,977,171	3,493,608	1,685,118	1,798,445
Netherlands.....	1907	464,583	32,773,291	7,882,066	17,495,071	7,396,154
Norway.....	1906	14,597	3,494,023	2,240,646	815,524	428,853
Portugal.....	1906	57,378	3,772,053	2,430,051	483,346	858,656
Roumania.....	1906	3,165	13,813,718	8,175,701	3,998,369	1,639,558
Russia, including Finland.....	1906	745,584	7,148,312	2,692,410	3,344,914	1,110,988
Servia.....	1907	340	2,887,336	1,448,813	1,192,978	245,545
Spain.....	1907	397,972	3,524,188	714,875	1,029,309	1,780,004
Sweden.....	1906	91,344	4,241,976	2,002,536	1,637,908	541,532
Switzerland.....	1907	113,218	19,887,617	9,414,441	3,897,495	6,575,681
United Kingdom.....	1907	4,773,802	48,037,591	8,807,396	2,099,608	37,130,587
Canada.....	1907	144,761	13,509,196	(2)	1,471,410	12,037,786
Cuba.....	1906	2,331	8,514,047	5,601,607	254,448	2,657,992
Mexico.....	1907	2,558	6,904,893	3,373,733	1,055,185	2,475,975
United States.....	1908	140,869	68,379,781	13,460,396	3,921,111	50,998,274
Argentina.....	1906	18	30,560,967	21,763,687	2,668,184	6,129,086
Brazil.....	1906	-----	33,257,740	21,696,527	3,617,420	7,943,793
Chile.....	1907	90	13,256,170	8,251,575	1,801,843	3,202,752
Peru.....	1906	-----	3,208,921	2,047,371	168,799	992,751
China.....	1907	31,015	78,231,129	38,844,213	37,672,149	1,714,767
Japan.....	1907	1,089,834	10,324,144	8,891,669	1,180,794	245,681
Korea.....	1906	395	4,570,112	2,394,826	770,640	1,404,646
Siam.....	1907	1,332	4,621,732	1,771,326	400,911	2,389,495
British India.....	1907	35,286	163,345,537	143,883,917	12,904,498	6,557,122
French Indo-China.....	1906	16,743	5,201,963	3,237,913	1,605,811	358,239
Dutch East Indies.....	1906	-----	22,436,710	19,028,074	2,246,379	1,164,257
Philippine Islands.....	1907	1,622	4,462,374	3,056,595	614,667	791,112
Australia.....	1906	2,282	32,574,800	18,912,574	1,582,011	12,080,215
New Zealand.....	1906	174	6,712,932	2,978,648	215,104	3,519,180
Egypt.....	1906	-----	17,095,815	15,529,230	1,201,717	354,868
Algeria.....	1907	185	11,466,297	10,111,656	164,796	1,189,845
Tunis.....	1906	-----	2,147,825	1,820,664	125,595	201,566
Other French Africa.....	1906	84	11,556,892	10,829,133	318,428	416,331
British South Africa.....	1906	-----	9,503,297	5,663,366	(3)	3,839,891
Other British Africa.....	1905	-----	9,559,470	(3)	(3)	9,559,470
German Africa.....	1905	-----	3,323,110	2,179,811	55,556	1,087,743
EXPORTS.						
Austria-Hungary.....	1907	5,372	20,688,909	13,466,604	2,174,899	5,047,406
Belgium.....	1907	355,555	57,009,622	18,424,494	9,990,454	28,654,674
France.....	1907	257,318	62,954,284	31,518,444	3,176,587	28,259,253
Germany.....	1907	237,047	108,156,482	35,349,664	7,966,566	64,820,252
Italy.....	1907	32,211	24,643,156	18,917,461	3,969,959	1,755,736
Netherlands.....	1907	341,717	27,033,247	21,635,720	4,433,214	964,313
Russia, including Finland.....	1906	13,289	12,642,220	(2)	(2)	12,642,220
Switzerland.....	1907	-----	47,671,678	6,629,152	3,243,607	38,399,519
United Kingdom.....	1907	660,704	552,348,801	395,558,444	99,267,237	57,523,120
United States.....	1908	7,633,997	25,177,753	14,208,683	400,600	10,569,675
British India.....	1907	1,917,888	44,680,875	12,575,036	31,605,619	610,220
Japan.....	1907	-----	28,407,530	8,128,399	15,172,078	5,107,053

¹ Compiled by the Bureau of Statistics, Department of Commerce and Labor. Owing to many differences in the methods employed by the several countries in classifying their imports and exports of cotton manufactures and in presenting the same, it is very difficult, if not impracticable, to harmonize the conditions so as to present strictly comparable statistics.

² Included in "all other."

The statistics of Table 17 are for the latest years for which reports are available and show the relative position of the different countries in this class of trade. The United Kingdom ranks first in exports of cotton goods, followed in the order of their importance by

Germany, France, Belgium, Switzerland, and British India. As regards imports of these manufactures, British India leads with \$163,345,537, followed by China with \$78,231,129 and the United States with \$68,379,781.

HISTORICAL AND DESCRIPTIVE.

Knowledge of the cotton plant and of the use of the fiber was many centuries in making its way from India, its birthplace, to the southern borders of Europe, and it appears to have taken many more to introduce the culture of the plant and establish the manufacture of cloth on that continent. The invasion of England followed and the Anglo-Saxon, with his characteristic perseverance and thoroughness, soon took and has continued to hold the lead in cotton manufacturing. Early English immigrants introduced the industry into America, where the cultivation of cotton has outstripped that in all other sections and the manufacture has made marvelous strides. A forceful illustration of the progress of cotton manufacturing, so far as the devices and inventions employed in connection therewith are concerned, is presented in the synoptic history given in the series of pictures designated as Figure 1, and the associated descriptions which have been furnished the Census Bureau by and published through the courtesy of the Smithsonian Institution, United States National Museum. These most interesting and instructive groups of pictures form one of the many exhibits of that institution which strikingly illustrate the thought and handicraft which have entered into the range of human achievements.

History of weaving.—The textile art embraces all work in fibers, whether they be vegetable, animal, or mineral. It includes the processes of procuring the fiber from nature, the cleaning and hackling of material, the spinning of yarn, the twisting of thread, twine, or rope, as well as weaving, netting, knitting, lace making, and embroidery. Each one of these several processes has had a development from some natural process, such as the lacing of fiber, the twining of vines, or the web making of spiders. The apparatus at first was of the most simple character cooperating with human fingers; but in the unfolding of the art, the powers of nature and machinery have been called more and more into play. The latest automatic looms are marvelous expressions of the human mind speaking through mechanical devices.

Illustrations of this art are here limited to three series of objects, each showing something of the steps of progress from simple to highly perfected forms. Series 1 represents the spindle; series 2, the shuttle; and series 3, the loom.

The spindle (series 1).—A spindle is a device for twisting fiber. Human fingers formed the first spindle, and there are now tribes living in British Columbia, Alaska, and other parts of the world where excellent yarn and thread are produced with no instrument whatever. The class of implements called spindles begins with a simple, pointed rod, which acts also as a bobbin. It is the first device for converting rectilinear into continuous circular motion. The stick is rolled on the thigh with the palm of the hand, and the twisted fiber is then wound upon this simple shaft. There were added the spindle whorl, the hook at the top of the spindle to enable the operator to walk about, and the fixed bearings by which the apparatus becomes a machine. The band wheel and other devices for multiplying motion led through the large wheel and the small, or Saxon wheel, to machine spinning.

The shuttle (series 2).—The shuttle is a device for passing weft filaments between warp filaments. This process was first per-

formed by the human fingers in plaiting, as in the matmaking of the Polynesians, Africans, and American Indians. The simplest shuttle is a rod on which the weft is wound. Improvements in the shuttle consist of devices for guiding the apparatus more quickly and smoothly between the warp filaments, and end in the modern machine shuttle, which is automatically driven (with incredible rapidity) backward and forward between the "sheds" of the warp. The objects presented in this series are suggestive of the salient features in the line of progress. The Pueblo Indians use a rod of wood, and wrap yarn upon it somewhat as children wind a kite string. A twig with a notch at each end, a slat with closed points, as in netting needles, and a hollow stick pointed and furnished with the rudest sort of bobbin, have been used by different peoples in the hand epoch of culture. With the domestication of the physical powers and the improvement of the loom, the shuttle became more and more effective.

The loom (series 3).—The loom is a framework on which weaving is done. Essentially it consists, first, of two crossbeams, called the "yarn beam" and the "cloth beam," on which the warp is laid evenly; secondly, of devices for crossing the alternate warp threads so as to form "sheds," through which the shuttle is passed backward and forward; and third, of some sort of batten, by means of which the weft is beaten home after the shuttle has made an excursion.

Many other mechanical parts have been added to this machine from time to time, but the simplest loom is a framework in which much of the operation is still performed by hand, while in the most complicated looms all the operations are performed automatically. In some tribes of our Indians and among rude peoples elsewhere the loom is little better than a darning machine. The fingers are the only harness, and often the side of the hand acts as the batten. In Chinese matting looms and in the beltweavers' outfit of the southwestern United States, the warp is shifted by a wooden harness and the weft is beaten home by a wooden sword. Pedals are not used in any of these early forms, because in all occupations both men and women sit on the ground at their work.

The only important factor which would appear to be missing from the illustration is the cotton gin. The early method employed in India for separating the seed from the fiber by machinery was by means of a hand device known as the "Churka." The modern roller gin, which no invention has ever yet displaced in the treatment of the finest fiber, like that of sea-island cotton, is but a modification of this device. The saw gin invented in 1793, because of its productive capacity, inaugurated the era which was to develop the industry of "cotton ginning" and revolutionize the culture and commerce of the staple. Following the early separation of the fiber and the seed the next step may have been the application of a fish bone to the carding of the fiber, a device which is still in use in some countries and of which the modern carding is but a modification. Twisting upon a distaff, in the same way that cotton and flax are still spun in India, may have been the next step in the process of the art, and, through gradual development, the modern spindle and loom were constructed.

Until about 1773 the cotton manufacture in England as well as the very limited industry in the Amer-

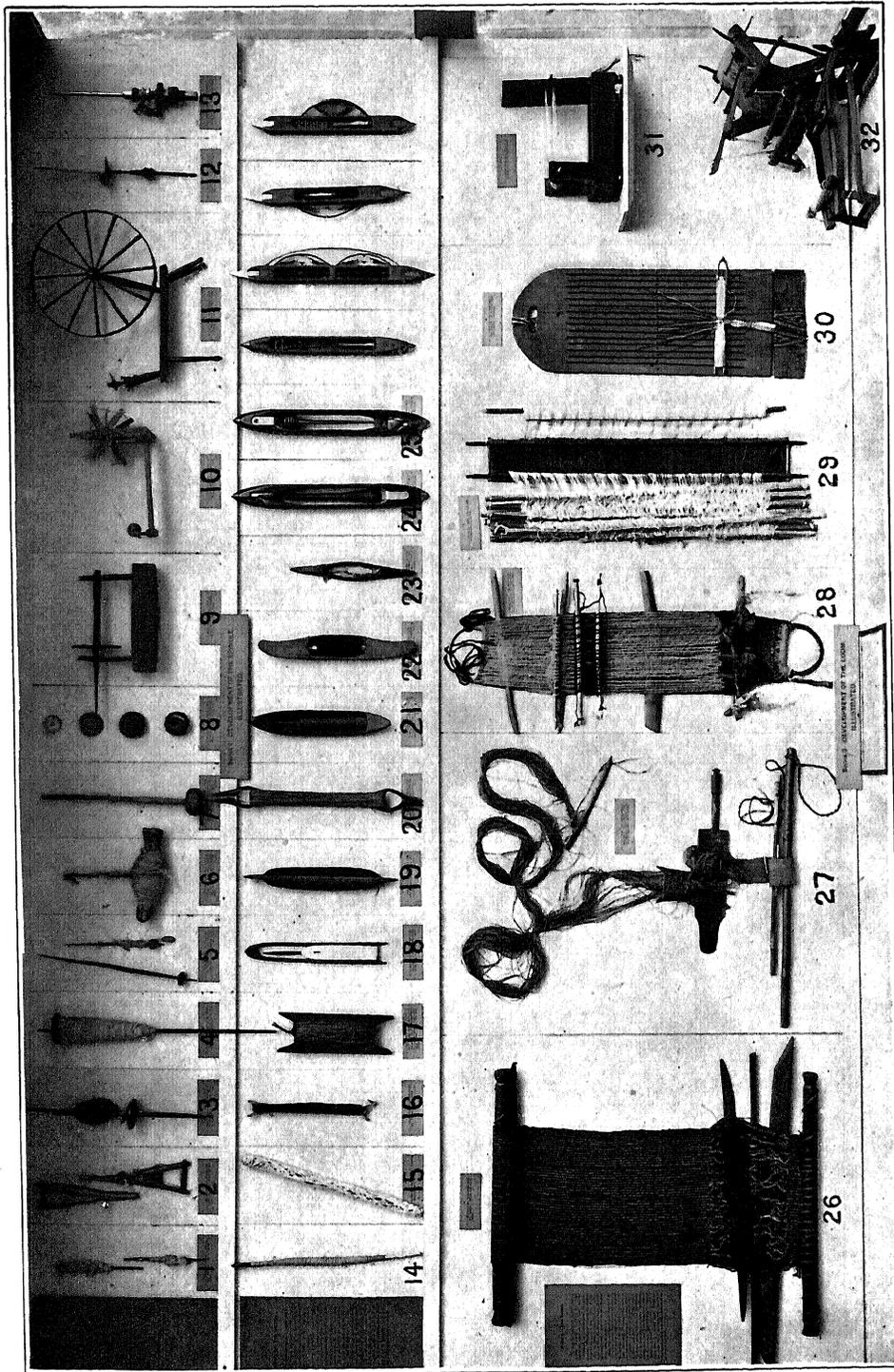


FIG. 1.—SYNOPTIC HISTORY OF DEVICES AND INVENTIONS USED IN THE MANUFACTURE OF COTTON.

SPINDLES.

1. Simple form of spindle. A wooden peg on which yarn or thread is wound.
2. Silk winder. Forked bamboo rod, spread for holding wound silk filament. China.
3. Spindle, with whorl. Shaft, of hard wood; whorl, of bone. For winding coarse cedar bark. British Columbia.
4. Central American spindle. Shaft, of palm wood; whorl, a hard seed. For spinning cotton. Yucatan, Yucatan, Yucatan.
5. Peruvian spindle, for fine staple. The thread is looped over the top of the shaft, when the spinner walks along.
6. Tibetan spindle. Shaft, a twig of cherry, with hook atop; whorl, of clay, at the bottom of the shaft. The spinner walks about.
7. Tibetan spindle. Shaft, a twig with notch and groove on the top; whorl, of clay, at the bottom of the shaft. The spinner walks about.
8. Primitive spinning wheel. Spindle whorls of various materials and forms.
9. Shaft set in bearings; whorl, enlarged for fly wheel. The beginning of China.
10. Bobbin winder. In which the spindle is driven by a primitive fly wheel.
11. Model of large spinning wheel for cotton and wool. Simplest form, without speed pulley.
12. Spindle of small, or Saxon, spinning wheel, with different sized pulleys to regulate speed. The Saxon wheel works with treadle.
13. Spindle, used most generally in cotton spinning machines in the United States. SHUTTLES.
14. Primitive shuttle. Twig of osier with thread simply wound about it.
15. Wooden rod with weft wound diagonally about it.
16. Shuttle, of antler, pronged at each end. Eskimo of Norton Sound.
17. Rag carpet shuttle. A block of wood notched roughly at each end and used in the domestic hand loom for weaving carpet of rags, coarse chain of jute, cotton, and other materials.
18. Japanese shuttle. Pronged at one end, closed at the other, with spindle in the opening. California.
19. Eskimo shuttle. Pronged at either end approaching each other and pointed.
20. Hupa shuttle. Slender shaft, pronged at the ends approaching like the beak of a bird.
21. African shuttle. Body, toggle shaped; bobbin, a simple cylinder of wood revolving on a spirit of palm leaf stem. Liberia.
22. Hand-loom shuttle. Body, toggle shaped; bobbin, a hollow reed working on a spirit of hard wood bamboo running on a spirit of wood.
23. Early machine shuttle. Of several pieces of wood and iron pointed; open on both faces; bobbin, a strip of modern shuttle. Right-hand shuttle, bobbin fixed, improved eye and apparatus for regulating tension.
24. Modern shuttle. Left-hand shuttle, with steel bobbin or "cop skaver". Used extensively in plain cotton weaving. LOOMS.
25. Mexican loom. With single head rod, primitive shuttle, and sword batten.
26. Aino loom. For weaving belts of ohio bark. Single head; primitive shuttle; sword batten; warp spreader with holes burnt through.
27. Navajo loom; with three head rods, sword batten, and weft of different colors in hanks, not in shuttles.
28. Babylonian loom; with four sets of headle, and reed batten.
29. Heddle cut from a single board. Other examples are made of reeds held in parallel crosspieces.
30. Italian loom, same as 30, in its heddle; with yarn beam and ratchet.
31. Hand loom; heddles, worked with treadles; batten, swung.
- 32.

ican colonies was chiefly confined to the production of coarse mixed fabrics, such as fustians, composed of linen warp and cotton weft, like the goods now called "unions," such fabrics at that time constituting much of the ordinary wear of the people of both countries. The demand for cotton in England was consequently limited, the total importations in 1781 amounting to only 103,976 bales of 500 pounds each. The manufacture of calicoes was attempted in England in 1765, but it was first undertaken with any degree of success by Arkwright & Co. in 1772. In this latter year Messrs. Strutt, of Derby, also made the first cotton goods in England with a cotton warp spun on the water frame patented by Arkwright in 1769—neither the first spinning jenny invented by Highs in 1763 nor the more efficient machine of Hargraves, introduced in 1764, giving the thread sufficient twist to form a warp yarn. About this time, also, the bleaching and printing of cottons had become general in England. The introduction of the mule spindle, by Crompton in 1775; of steam carding and spinning, by the Watt engine about 1783; of the power loom, by Cartwright a few years later; of cylinder printing, by Bell in 1785; and of the use of chlorine in bleaching about the same time, with a few minor agencies, completed a train of improvements in this branch of industry which gave the first great impetus to cotton manufacture in England.

The rapid development of the cotton manufacturing industry in the United States is one of the most remarkable events in the history of the country. As early as 1640 the general court of Massachusetts made an order for the encouragement by bounties of the manufacture of linen, woolen, and cotton cloth. In this it was followed about nine months later by the assembly of Connecticut, which took measures to encourage the importation of *cotton wool* from the Barbados. About the same time a company of Yorkshire men who settled at Rowley, Mass., in 1638 engaged in spinning and weaving cotton, flax, and wool, later, in 1643, erecting at that place the first fulling mill in America.

As in Great Britain, however, the manufacture in this country properly dates from the introduction of the Arkwright machinery, which took place in 1790, although as early as 1775 a spinning jenny of 24 threads was put in operation by a joint stock company at Philadelphia. Here, in 1782, Samuel Wetherell, jr., one of the company, advertised for sale what were probably the first factory-made "jeans, fustians, everlasting, etc." in this country, but up to 1790 no sheetings, shirtings, checks, or ginghams had been made here. The warp for the first goods manufactured wholly of cotton was supplied by a water frame cotton mill at Pawtucket, the equipment of which consisted of three carding machines, one draw-

ing and roving machine, and two Arkwright spinning frames of 72 spindles, the latter being the first machines of the kind successfully operated in the United States. *The product of this mill, small as it was during the first twenty months, far exceeded the demand of the hand weavers and buyers.*

In 1794 the first cotton sewing thread ever made is said to have been spun from sea-island cotton, the cultivation of which was just beginning in the South. The introduction of stocking yarn in America was made about this time by Mr. Samuel Slater. The prices of yarn in Rhode Island at this time are recorded as being 88 cents per pound for No. 12, \$1.04 for No. 16, and \$1.21 for No. 20. About 1804 cotton machinery, clandestinely obtained from England, was introduced into a large factory previously run as a woolen mill at Byfield, Mass., and for a time was employed upon warp yarn and wicking for household manufactures. A few years later the manufacture of tickings, coarse ginghams, sheetings, and similar heavy materials was commenced at this factory, the first, it is said, of that class of goods made in this country. These were all woven on hand looms as power weaving was not in use at that date. The price of ginghams at that time was 75 cents, and of sheetings 50 cents a yard. It was during this year (1804) that the first consignment for sale of American cotton manufactures was made by Almy & Brown, of Providence, to Elijah Warren, of Philadelphia, who became their agent for selling American yarns and threads in great variety, to which were added, as business improved, stripes, plaids, checks, denims, tickings, etc. In 1808 a company with a capital of \$1,000,000 was incorporated in Maryland to manufacture coarse cotton goods on a large scale, beginning operations at Elliott's Mills, on the Patapsco river, in 1810.

In an official report made by the Secretary of the Treasury to Congress in 1810, the number of cotton mills erected up to the close of the previous year, including 25 then building, was given as 87. Of these, 62 were in operation and worked 31,000 spindles, requiring a capital of about \$100 per spindle, of which \$60 was actively employed. The average annual consumption of cotton per spindle was 45 pounds, worth 20 cents per pound, and the product 36 pounds of yarn per spindle, worth on an average \$1.125 per pound. These mills employed on an average 5 men and 35 women to every 800 spindles. The mills were distributed as follows: Rhode Island, 25, including 7 under construction; Massachusetts, 15, including 5 under construction; Connecticut, 6; Pennsylvania, 4; New York, 6; Maryland, 5; New Hampshire, 6; Kentucky, 6; Vermont, 4; New Jersey, 2; Delaware, 2; and in Maine, Virginia, South Carolina, Georgia, Tennessee, and Ohio, 1 each. Of these 87 mills, all those in Kentucky, South Carolina, Georgia, Tennessee, and Ohio,

2 in Pennsylvania, and 1 each in Delaware and Maryland were operated by animal power.

The first census of manufactures taken by the Government was in 1810, when 269 cotton manufacturing establishments, scattered throughout 18 states and territories and operating about 87,000 spindles, were reported. These factories were small, producing chiefly yarn and from 1,000 to 8,000 yards of cloth each per annum. The greater part of the domestic cotton then consumed was spun and woven in the homes of the people, and the aggregate quantity returned as so made was 16,581,299 yards, an amount estimated to exceed in measurement all the cloth made that year from flax, hemp, wool, and silk combined. Cotton duck, which of late years has been so extensively made and consumed in this country and which has entered so largely into our exports of domestic cotton fabrics, was then a new article, having just been introduced by Mr. Seth Bemis, a manufacturer of Watertown, Mass. During the year 1809, a small quantity of this material, made in Boston from sea-island cotton, was sold at 65 cents per yard for No. 1 and 58 cents for No. 2.

It was in 1810 that cotton goods were first printed in this country upon engraved copper rollers. This took place at a bleachery and print works established near Philadelphia, where calico printing from wooden blocks had been carried on since the year 1788 or even earlier. The first cylinder machine, enabling one man and two boys to print daily 10,000 yards of cloth, was imported from England in 1809 and put in operation by waterpower near Philadelphia. In 1822 the engraving of metallic rollers for calico printers was commenced in Philadelphia, and this led to the building of a number of plants about this time in Massachusetts, New Hampshire, New York, New Jersey, and Maryland. For the successful introduction of the power loom we are indebted to a Boston manufacturing company, chartered in February, 1813. This company built a factory of about 1,700 spindles at Waltham, Mass., for the manufacture of cotton products by the aid of the power loom, which was constructed with several improvements upon the basis of the English loom then in use. With improvements in other parts of the machinery this mill went into operation as the first one in which all the processes of manufacture were carried on in a single establishment. The first goods woven by the company were heavy unbleached sheetings, a class of goods which under the name of "domestics" has ever since formed the staple of American cotton manufactures.

With the introduction of power weaving numerous other mechanical improvements of domestic and foreign origin followed, and, encouraged by the protection given in 1816 by a duty of 25 per cent ad valorem on foreign cottons, manufacturing establishments in-

creased in size and number and in the completeness of their arrangements. In 1820, according to the imperfect returns of the marshals, the number of spindles in cotton factories in 15 states was about 250,000, while the amount of cotton consumed in these factories was about 20,000 bales of 500 pounds each, or about 40 pounds per spindle. As shown in Table 15 the total consumption at that time amounted to about 100,000 bales. Within a quarter of a century after the introduction of the power loom, cotton manufacture had attained the rank which it still holds as the first among the great branches of pure manufacture in respect to the value of the product, the amount of capital invested, and the number of persons employed in it.

In 1840 there were 1,240 mills in the United States with 2,284,631 spindles, in 1880 there were 756 mills with 10,653,435 spindles, while in 1908 there were 1,941 mills with 27,964,387 spindles. The decrease in the number of mills between 1840 and 1880 was due to the concentration of the industry in larger establishments. For instance, in 1840 the average number of spindles per mill was 1,842, in 1880 the number was 14,092, while in 1908 it was 14,407. The number of mills in 1840 and in 1880 includes weaving mills, while in 1908 only mills operating cotton spindles are considered.

The modern cotton mill has been developed within about a century and a quarter, having been made possible by the inventions of Arkwright, Crompton, and Cartwright and by the application of steampower. The hand machines, of which the carders, spinners, and weavers of the mountain sections of this country are still making use to some extent, although prehistoric in their kind, are of the same type as those which are now used in China and which have been used there for more centuries than the record of history covers; they are the same as those in use in other portions of Asia, by means of which the people, numbered by hundreds of millions, are served; they are the same as those pictured on the walls of the pyramids and are like those now used in Africa for her unnumbered hordes; and they are the same as those which may be found in all parts of South and Central America.

When cotton manufacture was first begun in the United States, waterpower was considered essential to the work, and as a rule the location of the mills was limited to narrow valleys. These early mills were narrow structures, but were frequently seven stories in height. In these the operators were required to work from 13 to 14 hours a day. The usual cotton mill building at the present time is two to four stories in height, varying in length according to the amount of machinery installed, and is well lighted and ventilated. The spinning and weave rooms of the modern mill are illustrated by Figures 2 and 3.



FIG. 2.—SPINNING ROOM OF A MODERN COTTON MILL.

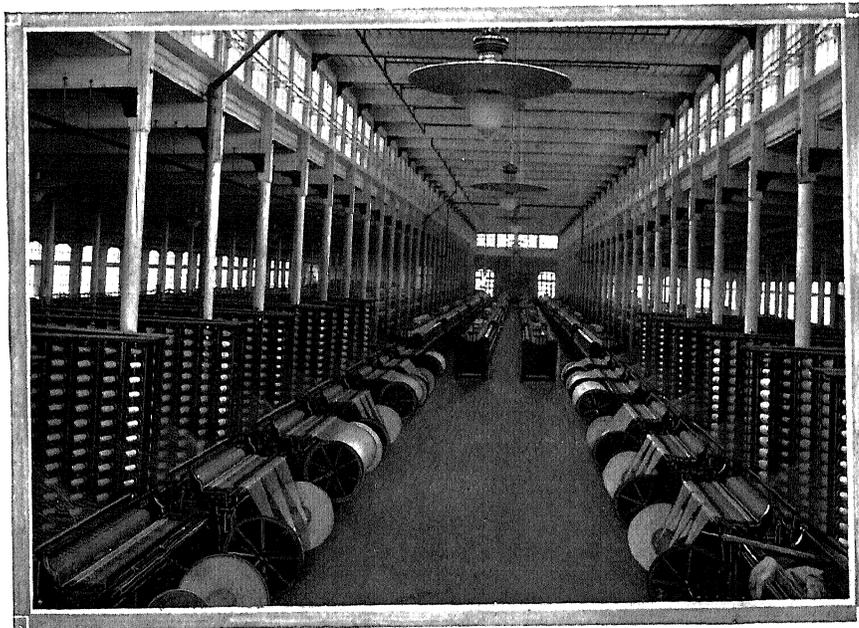


FIG. 3.—WEAVE ROOM OF A MODERN COTTON MILL.

UTILIZATION OF COTTON MILL WASTE.

A subject of increasing interest in connection with the cotton manufacturing industry is the economic handling of mill waste, an account of which is presented here somewhat in detail.

The spinning of cotton waste is vitally connected with economic manufacturing, especially in its relation to the problem of how best to utilize the waste of cotton mills. To rework all the cotton waste of the mills in the United States and to spin it into number 8 yarn, would, it is estimated, keep 1,000,000 spindles employed 52 weeks in the year. A large part of the cotton waste utilized in the United States is reworked in New England mills, the southern mills using comparatively little. At least one-fourth of the waste of the American cotton mills is sold to other mills and more than one-fourth of the total quantity is exported, chiefly to the mills of Germany and the United Kingdom. Many manufacturers are of the opinion that in mills making above 10's, the waste should not be reworked and respun, but should be sold to those spinning coarser grades of yarn. As a rule, yarn made from waste should be used for filling, the warp to be composed of good yarn made from new stock. The spinning of waste is an industry by itself, requiring just as

much skill—from the superintendent down to the most menial laborer—as that required for a higher class of manufacture. There is here a wide field for exploitation for both the manufacturer and the machine builder, for the profitable reworking of this inferior and low cost material requires good and most efficient machinery.

Cotton mill waste, as generally understood, includes droppings from the opener and scutch machines, brush strips from the cylinder and doffer cards, card room sweepings, comber waste, bobbin waste from fly frames and spinning machines, hard ends from cop bottoms, oily waste, and the like. Each of these classes of waste requires different treatment and frequently different machinery. While the quantity of waste varies with the conditions and character of the raw cotton, the effectiveness of the machinery, the operator, and the character of the products manufactured, the average quantity probably amounts to about 8 per cent of the raw material worked. On this basis the present annual amount of mill waste in the United States would be estimated at about 175,000,000 pounds.

Statistics of the exports of cotton mill waste distributed by countries to which exported are presented in the following table:

TABLE 18.—EXPORTS OF COTTON MILL WASTE, BY COUNTRIES TO WHICH EXPORTED:¹ 1908, 1905, AND 1900.²

COUNTRY.	1908		1905		1900	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total.....	45,784,473	\$2,631,595	19,435,332	\$1,040,356	12,940,380	\$610,120
Europe.....	39,190,461	2,251,852	14,662,148	750,347	8,828,141	404,428
Germany.....	19,300,145	972,090	7,529,249	403,578	5,947,738	257,114
United Kingdom.....	11,472,599	763,311	4,811,168	233,830	872,554	51,071
Belgium.....	3,870,390	166,797	1,250,840	57,338	334,650	12,779
France.....	1,636,670	138,976	31,246	2,178	222,703	11,357
Italy.....	1,666,644	121,425	519,394	35,383	178,464	9,054
Netherlands.....	115,093	2,365	502,074	16,739	1,197,953	58,681
All other Europe.....	1,128,920	86,883	18,179	1,301	74,069	4,372
North America.....	6,320,558	300,335	4,562,973	276,936	3,829,592	190,614
Canada.....	5,060,687	281,994	3,574,289	207,842	3,216,040	160,675
Central America.....	518,973	32,946	40,938	6,588	30,829	1,746
Mexico.....	176,127	9,810	444,735	26,036	358,600	14,475
Cuba.....	457,001	27,939	388,223	29,580	158,471	10,101
Other West Indies.....	66,518	4,870	55,615	4,115	41,877	2,541
All other North America.....	41,252	2,767	39,173	2,775	23,775	1,076
South America.....	233,607	16,637	158,092	11,609	218,985	11,323
Chile.....	12,895	977	25,625	1,859	119,434	5,646
Other South America.....	220,712	15,660	132,467	9,750	99,551	5,682
All other countries.....	39,847	2,771	22,119	1,464	63,662	3,750

¹ Compiled by Bureau of Statistics, Department of Commerce and Labor.

² Year ending June 30.

As indicated by the statistics of the table, there has been a marked increase in recent years in the quantity of cotton waste exported. The increase since 1905, however, is in reality not as large as the table would seem to indicate, for the reason that the exports in that year, 19,435,332 pounds, were much below the average at that time, the quantity exported in 1904 amounting to 26,258,471 pounds and in 1906 to 37,839,284 pounds. Of the total quantity exported more than 85 per cent is taken by European countries. It is especially in demand among manufacturers in Germany, where it is spun into coarse yarns from 4's

to 8's and used in the manufacture of toweling, bed-quilts, flannelets, imitation woolen goods, wadding for surgical purposes, packing for jewelry, and also for the manufacture of gun cotton, twine, candle and lamp wicks, mats, blankets, tablecloths, denims, napped fabrics, sponge cloth used for cleaning machinery, and for similar purposes. The utilization of this waste in the United States has received comparatively little consideration, but the general field of usefulness given to it by German manufacturers should be suggestive to American cotton mill man-agers.

WATERPOWER.

The utilization of waterpower has had a great influence on the cotton mill industry, and more than any other factor has determined the location of the mill centers of the United States. For many years after the establishment of the industry, waterpower was used almost exclusively to operate the machinery, although small mills were sometimes operated by animal power. In 1870 more than two-thirds of the power used in the industry was waterpower, in 1880 but little more than half, in 1890 about two-fifths, and in 1900 less than one-third. While the proportion of waterpower has been decreasing there has been a large increase in the total amount used, the figures being 99,191 horsepower in 1870 and 251,000 in 1905. The use of steampower has increased much more rapidly; in 1870, 47,117 horsepower was used, while in 1905 the amount was more than 700,000 horsepower.

The total horsepower returned by all of the cotton mills in the United States at the census of 1905 amounted to 1,031,843, compared with 805,126 in 1900. The number of electric motors owned in 1900 was only 275 and the horsepower represented 15,268. In 1905 the number of electric motors was 767, with an aggregate horsepower of 52,734. The number of such motors in New England increased during the five-year period from 1900 to 1905 from 86 to 303 and the horsepower from 7,126 to 22,455; their average horsepower in those states in the latter year was 74. During the same period the number of electric motors in the South increased from 157 to 329, the total horsepower from 7,835 to 28,078, and the average horsepower from 50 to 85. It is evident that a decided change is in progress in the character of power used. While it still remains true that steampower leads, the rate of increase between 1900 and 1905 in the amount of hydro-electric power used was more than 200 per cent, the actual increase in the five years being about 175,000 steam horsepower against nearly 37,500 horsepower accredited to electricity. The use of electricity as a motive power in the operation of cotton mills is having a marked effect on the location of new mills, and this is particularly true in those localities in the Southern states where waterpower is abundant.

The practice of generating electricity at large plants and distributing it to cotton mills and other industrial enterprises is growing rapidly. It is asserted that the cost per horsepower of installing a hydro-electric plant is usually less than that of a steam plant and that the labor cost of operation is less. This will be of increasing importance in the establishment of new mills where the outlay for a complete power plant will not be necessary. It may be stated in this connection that a power company located at Charlotte, N. C., owning gigantic power plants on the Catawba river, has made contracts with a number of mills in that general local-

ity to supply them with power. Of these mills, several are new and were encouraged by these developments. It is stated that about 40,000 electric horsepower will be supplied by this company alone for cotton manufacturing. Numerous other companies in this and adjoining states are engaged in furnishing power to cotton mills, while many new projects are either under advisement or are actually being constructed.

After seven years of careful work and study in connection with the measurement of the streams of the Southern Appalachian Mountain region and in making computations as to the possible undeveloped waterpower, it is forcibly brought out by the United States Geological Survey that this region possesses remarkable assets in waterpower resources. The results of the investigation of the Survey constitute the basis of an interesting report on the Southern Appalachian and White Mountain Watersheds recently published by the United States Department of Agriculture. Because of the recent development in cotton manufacturing in the Southern states and of the attention being directed to the question of economical power, the following excerpt from this report will be found interesting:

Based on the lowest two weeks of the year covered by the report an average for seven years shows that the streams named in the following statement afford 2,731,270 horsepower. This much power would be available the year round. In common practice it is found profitable to develop a waterpower to the minimum of the four high-water months of the year, depending upon steampower during low-water season to make up the deficiency. In order to be conservative in this estimate the time limit has been made six months. No streams or portions of streams were considered that did not flow out of the southern Appalachians. No streams with less than 500 horsepower were considered. In all calculations only 90 per cent of the observed fall and 80 per cent of the energy of the falling water is used. Moreover, three important streams—the Big Sandy, the Cumberland, and the Kentucky—are not included. With these allowances and omissions the minimum power for the year and for the six high-water months is as follows:

Minimum horsepower of southern Appalachian streams.

STREAM.	HORSEPOWER.	
	Minimum for the year.	Minimum for six high-water months.
Total.....	2, 731, 270	4, 830, 573
Potomac.....	131, 800	349, 556
James.....	155, 000	236, 474
Roanoke.....	131, 000	215, 709
Peedee.....	167, 800	250, 945
Santee.....	319, 590	472, 000
Savannah.....	209, 000	314, 000
Chattahoochee.....	145, 000	228, 800
Coosa.....	104, 589	177, 880
Monongahela.....	58, 900	235, 715
Great Kanawha.....	335, 000	853, 420
Tennessee.....	973, 600	1, 589, 474

It is estimated by the Geological Survey that at least 50 per cent of the indicated minimum horsepower, and probably much more, is available for economic development. On this basis the rental of 1,350,000 horsepower at \$20 per annum is worth \$27,000,000 per

year. If we take in the same way 50 per cent of the power which is present for half the year we increase this sum by \$11,000,000, bringing the total to \$38,000,000.

Electric development plants have sprung up on nearly all streams, and in great numbers on those flowing through the Piedmont plateau. While relatively little of the nearly 5,000,000 horsepower is as yet employed, its utilization is increasing at a marvelous rate.

Ready power to the value of \$38,000,000 will give the country tremendous advantage, not alone in manufacturing, but in transportation, in lighting, and in every kind of development. Waterpower is especially valuable to those sections which have no deposits of coal, and its advantages will steadily enhance in the future as the supply of coal grows scarcer and the price correspondingly higher.

In this connection the following excerpt from an article contributed to the September (1908) number of the *Engineering Magazine* by H. von Schon is interesting:

It appears from latest statistics that the present output of developed waterpower is 2,050,000 horsepower; and from data collected

by the author the undeveloped waterpower of New England aggregates 600,000 horsepower, of New York, Pennsylvania, and Middle states, 1,650,000 horsepower, of the Southern states, 4,000,000 horsepower, of Northern and Northwestern states, 1,050,000 horsepower, of the Pacific coast watershed, 800,000 horsepower, a grand total of 10,000,000 horsepower. This estimate is based upon the unconserved flow, or such a volume as is available during nine months of an ordinary dry year; in other words, it is the estimate in accordance with the present-day practice of ascertaining the available power output of a stream.

A reasonable estimate of our available waterpower assets appears to be 20,000,000 horsepower, representing the annual equivalent in steam fuel of about 300,000,000 tons. At \$100 per horsepower, this would require an investment in waterpower works of approximately \$2,000,000,000 and a further investment in hydraulic and electric power-generating equipment (at \$50 per horsepower) of \$1,000,000,000. At a valuation of \$35 per horsepower per annum (about 0.75 cents per kilowatt hour) for continuous service, the income at 3 per cent represents a total earning on about \$20,000,000,000.

FUTURE DEALINGS IN COTTON AND THE GRADING AND CLASSIFYING OF THE FIBER.

In view of the interest which has been shown recently in transactions in cotton futures and in the classification of cotton, the following information excerpted from the report of the Bureau of Corporations of the Department of Commerce and Labor under the resolution of Congress of February 4, 1907, directing an investigation of the causes of the fluctuations in the price of cotton and the differences in the market price of the various classes of cotton, will be found interesting and is accordingly inserted for reference:

Origin of future system in the cotton trade.—Future trading in cotton, in the modern acceptance of the term, is of comparatively recent origin. Up to about forty-five years ago future sales of cotton were virtually unknown. There were practically no short sales—that is, merchants at this date would not contract at a time when they had no cotton on hand to supply a spinner with his requirements at some future date and run the risk of not being able to secure the cotton in the meantime. Instead, spinners, both in this country and abroad, usually accumulated large stocks of actual cotton for their future needs. Indeed, at this time an extensive system of forward or future contracts was almost impossible, owing to the lack of adequate means of communication. The first successful Atlantic cable had not been laid and the telegraph was still in its infancy, while the telephone had not been invented. It is true that future transactions in cotton were made during the Civil War, but it appears that the price at which the cotton was secured was considered of less importance than the certainty of getting the cotton at all, and there was nothing like what could be called a future system at that time.

There can be no doubt that the extremely unsettled conditions which prevailed just after the close of the Civil War had much to do with the development of the future system. With many plantations in the South ruined, the cotton crops of that period were comparatively small. The average crop in the United States for the three years ended in 1861 was over 4,400,000 bales, whereas for the four years ended in 1869 the average was only about 2,500,000 bales. Prices in the later period were extremely high, and owing to the unsettled state of affairs, and particularly of the currency, fluctuations were violent. The spinner who was about to contract ahead for the sale of his cotton goods was unwilling to depend upon day to day purchases of cotton at widely varying prices, and yet was

unable to buy his entire wants at once in the spot market. On the other hand, the cotton merchant was anxious to dispose of his stock when prices touched a high level and to sell an additional quantity at such high levels for more distant deliveries. The two parties in the market were therefore both ready for some system by which they could go beyond the narrow limits of the moment. Both were, in other words, ready for organized future trading. The introduction of the future system was undoubtedly hastened by the remarkable improvement in means of communication and transportation which occurred just at this period, particularly by the extension of telegraphic service and the successful operation of the trans-Atlantic cable.

A further fact was that the new system greatly facilitated speculation. Hitherto speculation in cotton had been mainly on the buying side, and was in the form of an accumulation of a stock in anticipation of an advance in the price. The future system, through the opportunity which it offered for forward or short sales, enabled speculators with equal facility to sell cotton at a time when they did not actually possess it, in anticipation of an expected decline. Under these conditions the development of the system, as just stated, progressed rapidly. By 1868 future sales had become a distinct feature of the cotton business.

During the period from January 1 to August 31, 1869, the total sales of such contracts in the New York market amounted to 101,665 bales, as compared with 873,563 bales of spot transactions. In the next crop year, during which the exchange was organized and a regular form of contract adopted, dealings in these forward deliveries aggregated 591,586 bales, as compared with 816,410 bales of spots. In the crop year ended August 31, 1871, there was an enormous increase in the volume of future trading, which reached a total of nearly 3,000,000 bales, as compared with 733,905 bales of spots.

This remarkable increase in the volume of business created a necessity for the establishment of rules and regulations for its systematic conduct, and this, in turn, led to the organization of cotton exchanges. The New York Cotton Exchange, the first of these institutions in this country, was organized on September 7, 1870, as a voluntary association; in April, 1871, it was incorporated under the laws of New York. Shortly afterwards cotton exchanges were organized in various southern cities. The New Orleans Cotton Exchange was formed in January, 1871; the Mobile Cotton Exchange in December of that year; the Galveston Cotton Exchange and Board of Trade, the Savannah Cotton Exchange, and the

Charleston Cotton Exchange in 1872; and the Memphis Cotton Exchange in 1874. Among other cotton exchanges may be mentioned the Houston Cotton Exchange and Board of Trade, the Vicksburg Cotton Exchange, the St. Louis Cotton Exchange, the Augusta Exchange and Board of Trade, the Norfolk and Portsmouth Cotton Exchange, the Little Rock Board of Trade, and the Shreveport Cotton Exchange.

Organized dealings in cotton futures at the present time are conducted upon only two of the exchanges in this country, the New York Cotton Exchange and the New Orleans Cotton Exchange. The future system has been tried, at one time or another, on the Memphis Cotton Exchange, the Galveston Cotton Exchange, the Mobile Cotton Exchange, and a few others, but was never really established in any of these cities, largely owing to the lack of a sufficiently broad market. The exchanges on which futures are not dealt in are mainly concerned with the regulation of spot transactions and in the collection and distribution of information relating to the cotton market.

Abroad, the principal cotton exchanges are the Liverpool Cotton Association, the Havre Bourse, and the Bremen Cotton Exchange. The Liverpool Cotton Association was organized in 1842, but future dealings were not inaugurated by it until 1870. No organized future dealings are conducted on the Bremen Exchange, and only a limited volume of such business is transacted at Havre. In Liverpool, however, there is a broad future market, in which hedging operations are an especial feature.

Cotton exchanges were in their origin primarily associations of merchants and intended to facilitate the business of such merchants. Although spinners (the consumers) and planters and growers (the producers) are sometimes members of exchanges, the basis of such organization is the cotton merchant. The merchant is a dealer in actual cotton. He may buy either directly from the grower or from so-called interior merchants, who are practically storekeepers and who collect cotton directly from the grower. Such a merchant, it may be noted, is generally spoken of in the trade as a "buyer," the term "buyer" having a technical sense. Other cotton merchants who receive cotton on consignment to be sold on a commission basis are known as "factors." They sell their cotton to cotton "buyers" and seldom directly to spinners. There are thus two sets of middlemen. The number of factors, it may be noted, has decreased heavily in recent years. A cotton exchange also includes a great many brokers who may not handle actual cotton at all, but who simply act as agents for other interests, particularly for spinners, merchants, or speculators, either in the purchase or sale of spot cotton or of future contracts. Many brokers, it may be noted, deal exclusively in contracts and have nothing to do with spot cotton, while so-called spot brokers frequently have nothing to do with future contracts.

Grades of cotton.—The cotton crop comprises a very wide range of quality. This is largely due to the peculiar nature of the plant, which, instead of maturing its product at practically one time, produces over a long period. Thus, of the cotton bolls of a single stalk, some may open, say, late in August or early in September, whereas others may not ripen for many weeks or even several months, this depending largely upon the weather. Moreover, the gathering of the crop, which begins about August, is seldom really completed before February of the following year, although, of course, the great bulk of the crop is gathered long before this.

These factors have a very important bearing upon the quality of the crop. That portion of the crop which ripens first is ordinarily of a brighter color and much more free from dirt than that gathered toward the end of the season, when, owing to continued exposure to changes in the weather, such as frosts and storms, the cotton becomes more and more discolored and damaged. The grade of cotton is also affected by the method of gathering and weather conditions. Carelessness in picking, which results in getting an undue amount of stem and leaf into the staple, materially lowers the grade.

The grade of cotton, as recognized by cotton exchanges, is, in the main, determined by the degree of color and the amount of foreign matter, such as leaf and dirt, which it contains. The length of the staple, although an extremely important matter in determining the spinning value of cotton, is a distinct consideration, which is not regularly taken account of in official classifications. There is, of course, a general relationship between grade and spinning value.

In the grading of cotton, thirteen distinct grades are very generally recognized in the spot cotton markets of this country. These grades are as follows: Fair, strict middling fair, middling fair, strict good middling, good middling, strict middling, middling, strict low middling, low middling, strict good ordinary, good ordinary, strict ordinary, and ordinary.¹

Of the grades in the above list, those designated "strict" are commonly spoken of in the trade as "half grades," the others being "full grades." Some authorities recognize quarter grades also, the number usually being twelve, designated by the prefix "barely" or "fully."

The values above middling run from one-sixteenth to one-eighth of a cent the pound for quarter grades and one-eighth to one-fourth of a cent the pound for each quarter grade below middling. These differences in values are regulated naturally by the supply. For instance, a low grade crop will cause differences to widen on grades below middling and shrink on grades above, with conditions reversed on a high grade crop.

This range, however, covers only what are known as white cottons; that is, cotton showing practically no discoloration, although not necessarily strictly white, especially in the case of the lower grades. Cotton that is discolored falls in different classes, although the same grade names are still maintained, being qualified according to the degree of color by such adjectives as "tinged" or "stained," as, for instance, "strict good middling tinged," "strict low middling tinged," "good ordinary tinged," "low middling stained." The tinged and stained grades can not readily be described. Tinged cotton is only moderately discolored; stained cotton may range anywhere from a light yellow to a deep red or as it is called in the trade "foxy" color. It may be noted that tinged or stained cottons do not have any fixed value in relation to white cottons of the corresponding grade names; that is to say, low middling tinged cotton does not necessarily come next in value to low middling.

The basis grade in all markets is middling white cotton. This grade is the universal standard by which the quality of all the other grades is measured. It is a fleecy cotton, very nearly white in color and containing only a small amount of foreign matter. Fair cotton, the highest grade recognized, is a very bright, white, clean cotton. The other grades down to "ordinary" contain an increasing amount of foreign matter, and the lowest grades usually are somewhat dingy; for instance, good ordinary which is the lowest so-called white grade that can be tendered upon future contracts either in New York or in New Orleans, contains a large amount of leaf and stem and oftentimes more or less dirt. Below low ordinary are some miscellaneous classes of cotton for which there are no recognized grades and which are of such poor quality that no mention need be made of them here. The tinged and stained grades, as just noted, are in groups by themselves.

Every crop is more or less distinctive in character. Thus, one crop may be very bright and white, another may be of a "creamy" character, another dingy. On this account the trade often speaks of cotton as being of "good color," meaning that while it may not be strictly white it is not discolored by being tinged, spotted, or stained.

Difficulties in grading cotton.—Owing to the fact that a large number of grades of cotton are tenderable on future contracts—always at some relative value as compared with middling—the classifica-

¹Some markets also recognize grades of strict low ordinary and low ordinary.

tion of cotton becomes a very important matter, and a brief description of the method of classification as employed in the South and that used at New York is necessary.

It should be emphasized that the classification of cotton can not be performed with absolute accuracy. It is admitted by nearly all interests in the cotton trade that no two experts would class a large lot of cotton of assorted grades exactly alike; and, furthermore, that the same expert, classing a large lot of cotton twice, probably would not return exactly identical classifications. The classification of cotton is almost entirely dependent upon the eye. There are no mechanical means for performing this work. The differences of cleanliness, amount of leaf, and amount of color are so gradual that it is exceedingly difficult, in classing cotton into the half grades, to determine exactly where each individual bale should be placed. The difficulty increases as the grade of cotton falls below middling. With the grades of middling and above, it is a much simpler matter to class cotton with reasonable accuracy.

What might appear to be very unimportant conditions exert a material effect upon the classification. Thus, a passing cloud may easily influence a classer, quite unconsciously, almost to the extent of a quarter of a grade. When snow is on the ground it is very difficult to class cotton if the light is reflected upon the cotton or into the eyes of the classer. Still again, very few bales of cotton are exactly uniform in character, so that if two small samples are taken from different parts of the same bale they might easily show a decided variation. As shown elsewhere, it is customary in the New York market, where two samples are drawn from each bale, to reject the higher sample. Even a single sample of a few ounces, however, may not be absolutely uniform in character. When it is stated that a bale of cotton weighing, say, 500 pounds represents on an average approximately the yield of $2\frac{1}{2}$ acres of land, and that picking, on account of the low grade labor employed, is often carelessly done, it is easy to see how classification based on a sample of only a few ounces may give rise to much dissatisfaction.

The difficulties attending the classification of cotton are further illustrated in the following statement by a member of the New York Cotton Exchange:

There are certain people who say that the grades of cotton, or the types of cotton by which the grades are determined, should be mechanically fixed, and that the classification committee should be required to classify mechanically in accordance with those mechanical types. Now, everybody who has had any experience with cotton classers knows that the classing of cotton is not a mathematical and mechanical art; it is the work of the artist, essentially. The good cotton classer does not class cotton by a mechanical standard. I have seen that well illustrated in the case of one of my own classers in the South—one of the very best classers I have ever known—who would class 2,000 to 3,000 bales of cotton a day, and who would turn out the most beautiful lots of even-running cotton that I have ever seen in my life. But a peculiarity of that man was that if he hesitated over a sample and took it up a second time and considered whether he was right or wrong, he always got it wrong. * * * Classing of cotton is a great deal more than matching samples. It is a matter of the eye and the judgment, a certain feeling that only a man with an artistic temperament can have. All good cotton classers are in a way artists. Now, if you ask an artist why he drew such and such a line in such a way and in such a place, he can not tell you. No cotton classer can tell you why he classes a certain sample of cotton as strict low middling and another sample as strict middling; he just knows that it is so.

An absolutely perfect system of classification for cotton, therefore, can not be hoped for. One partial remedy which has been suggested is the adoption of uniform standards or types by all the leading cotton exchanges.

Grade differences.—There are two great cotton exchanges in this country, New York and New Orleans, where organized future

dealings are conducted. All future trading on both these exchanges is in so-called "basis" contracts—that is, contracts which permit the delivery of a number of "grades" of cotton on one contract. The seller of this contract may deliver thereon any grade he chooses within the range prescribed by the exchange. The buyer has no option. The proper theory of a basis contract, however, is that all grades shall be deliverable at prices which will make them commercial equivalents of each other. Cotton is graded substantially on its color and on the amount of leaf and other foreign matter, all materially affecting its market value. "Middling" cotton is always the basis grade, the grade for which the price is fixed by the parties to the contract. The prices at which other grades are deliverable are determined by the so-called "differences" above and below—or, in trade parlance, "on" and "off"—middling.

It is well known to every person acquainted with the cotton trade that the difference in the prices of the several grades of cotton changes from time to time according to the supply or the demand for different grades; thus the difference between middling and low middling may be one-half cent at one time, while, under certain conditions, it may be 1 cent at another time. In the settlement of contract deliveries, these differences in the value of the grades are determined by fixed rules of the exchanges. The report of the Commissioner of Corporations discusses this question as follows:

There are two ways of establishing these differences. For the last eleven years the New York Cotton Exchange has had a so-called "fixed-difference" system. A committee of the exchange, commonly known as the revision committee, meets twice a year, in September and in November, and establishes the respective price differences, on or off, which shall apply to the grades other than middling. These differences, once established, can not be changed until the next regular meeting, and govern all contracts in futures.

The New Orleans Cotton Exchange, on the other hand, has what is known as the "commercial-difference" system. A committee of the exchange meets daily, and, upon information of actual "spot" transactions, quotes the prices of the various grades, which quotations virtually establish the differences which apply on future contracts. That is to say, the New York system arbitrarily fixes what the differences for all grades shall be for two months or for ten months, while New Orleans follows the actual market difference for these grades as established by daily spot transactions.

The buyer of a future contract can not specify the grades to be delivered thereon. Obviously, therefore, he is greatly concerned as to the "differences" at which he may have to accept the various grades. He knows exactly the price for one grade—that is, middling cotton. That price was stipulated in his contract, the so-called basis price. But as to the prices which he must pay for other grades he is dependent upon the exchange differences. The underlying principle of a basis contract undoubtedly is that if the seller does not deliver middling cotton he shall substitute other grades only at their true value relative to that of middling in the spot market at the time of delivery—that is, at the actual commercial differences. This, clearly, is the only equitable basis. Under these conditions, as far as price is concerned, a basis future contract is substantially the equivalent of a contract for middling cotton. Consequently the market price of basis future contracts for immediate delivery should be practically the same as the price of middling cotton in the spot market. There is, however, properly a small regular margin between the two, because some expense is involved in sorting out and disposing of the mixed assortment of grades likely to be received on contract.

For all interests legitimately using the exchange, it is highly desirable that this margin should be comparatively constant in amount—that is, that there should be a substantial “parity” maintained between the spot price of middling cotton and the price of middling cotton on contracts for immediate delivery. A future contract is supposed to represent actual cotton, and from the very nature of things such a parity should be preserved. The respective merits of “fixed” and “commercial” differences are, therefore, roughly indicated by their effect on this parity. In general, it may be said that the commercial-difference system maintains this parity far better than the fixed-difference system. This is because the commercial-difference system is based on actual daily transactions in cotton, so that the same influences that affect the differences in spot transactions also affect the future contract differences, and thus maintain the parity between the price of future contracts and the price of spot middling cotton. Under a proper application of the commercial-difference system the operator in future contracts can base his calculations on the course of middling cotton, and is able largely to disregard differences for other grades, since he relies on the exchange to keep these constantly correct.

Under the fixed-difference system, on the other hand, the operator, besides considering the probable course of the middling price, must also consider the course of the prices of all other grades. Fixed differences are an attempt to establish arbitrarily, and months in advance, the relative values of grades.

Basis contracts permit the delivery of a wide range of grades, the values of which are determined by applying the differences as related to middling cotton. At the present time the contracts of both the New York and the New Orleans exchanges permit the delivery of cotton as low in grade as good ordinary, besides certain tinged and stained grades. A very large percentage of the cotton manufacturers and cotton merchants believe that the number of grades deliverable on contracts should be more limited. After discussing various limitations, the report of the Commissioner of Corporations submits this conclusion:

Low-middling clause.—The most practical suggestion for a limitation of the present range of grades is the so-called low-middling clause; that is, the exclusion of all white cotton below the grade of low middling from delivery on contract and possibly all tinged or stained cotton below that in value. This would not only elimi-

nate a number of the lowest grades now deliverable, which are objectionable both on account of the controversies to which they give rise and on account of their unfortunate effect in reducing the contract price, but it would also tend to exclude substantially all unspinnable cotton.

Proposed establishment of uniform grade standards.—Numerous suggestions looking to the improvement in methods of classification in both the New York and New Orleans markets are discussed in the body of the report. One of these is a recommendation for the establishment of uniform standards of the leading grades of cotton in all markets. This is an exceedingly important matter, and, while there are some practical difficulties in the way of its accomplishment, these do not appear to be insurmountable. The establishment of such uniform standards, even if applied only to cotton tendered on future contracts, should go far to reduce the friction which has been an almost constant feature of classification up to this time. An especial advantage of such standards, aside from their tendency to reduce controversies over grading, is that they tend to harmonize quotations of the various grades in different markets. It is suggested that the New York Cotton Exchange use the differences of several southern markets as a basis for determining its contract differences. One objection advanced against this plan is based on the admitted discrepancies between the standards of different markets, which discrepancies, of course, tend to affect the quotations, although this difficulty can be largely overcome. The adoption of uniform standards, by tending to promote uniformity in the basis of quotation, should go far to eliminate this objection.

Years ago an attempt was made to secure the establishment of uniform standards by joint action on the part of the leading cotton exchanges, but the movement fell flat, and similar efforts made from time to time by the New York Cotton Exchange have failed to meet with much response from southern markets or from Liverpool. There is no good reason, however, why such efforts should be abandoned. Instead, an earnest attempt should be made at once to secure the establishment of uniform standards. A provision for the establishment of such standards by experts to be selected by the Secretary of Agriculture was included in the agricultural appropriation bill for the fiscal year 1908-9.

Nevertheless, it is desirable that the New York and New Orleans exchanges specifically provide for the rejection of cotton of distinctly weak staple. Similarly, it is desirable that both exchanges define more specifically in other respects the characteristics of cotton which shall be tendered on contract. At the present time too much latitude is left to classification committees and arbitrators.