

THE
COTTON WORLD

JOHN A. TODD, M.A., B.L.

THE
COTTON WORLD

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THE COTTON WORLD

A SURVEY OF THE WORLD'S COTTON
SUPPLIES AND CONSUMPTION

FOUNDED ON LECTURES DELIVERED AT THE
CITY SCHOOL OF COMMERCE, LIVERPOOL

COMPILED AND EDITED BY
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PREFACE

SINCE 1924 this School has been providing courses of lectures for those engaged in the Liverpool Cotton Trade, in which an endeavour has been made to cover not only those sections of the cotton industry which are located in Liverpool but also, though necessarily in a more summary way, the manufacturing sections, the world's markets for cotton goods, and the organization of the industry as a whole. For the convenience of the students summaries of many of these lectures were prepared, and in two cases—the Liverpool Cotton Market and the Lancashire Cotton Industry—these appeared in the *Journal* of the Liverpool Chamber of Commerce. As there has been a considerable demand for these summaries it has been thought desirable to bring them all together in book form. The work of compiling and editing the summaries has been done by the writer throughout, but the names of the original lecturers are given, and in almost every case the text has been submitted to the lecturers for approval.

The book necessarily suffers from the very severe compression which was inevitable in view of the wide scope of the subject, but at the end of each chapter references have been given to any standard works which deal more fully with particular aspects of the subject. The compression has been particularly severe in Chapter III, which deals with the manufacturing processes. It is just here, however, that least harm is done, because that part of the subject has been adequately dealt with in many other books. On the other hand, the chapter on the Liverpool Cotton Market, especially the section dealing with Futures, has been allowed to expand,

because that is the one part of the subject which it is most difficult to find adequately treated elsewhere. The enormous size and complexity of the world's cotton industry has hitherto deterred anyone from attempting a complete survey of the trade as a whole ; but it is hoped that this bird's-eye view of the whole ground may prove useful to those who at opposite ends of the industry are separated from each other by half the width of the world. It is peculiarly true of the cotton industry that "one half of the world does not know how the other half lives" ; and as it has been the writer's privilege to see something of most sections of the trade in America, Egypt, and India, as well as in Lancashire and Scotland, and in the hosiery and lace trades of the Midlands, he has had many opportunities of realizing how eagerly the worker in each section desires a little elementary knowledge of those others on which he is so largely dependent. It has, therefore, seemed to him worth while to attempt the impossible ; and if the result is found acceptable it may be possible before long to extend it into a much larger volume, which would allow of each subject being dealt with more adequately.

JOHN A. TODD

CITY SCHOOL OF COMMERCE, LIVERPOOL.

June, 1927.

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THE COTTON WORLD

CHAPTER I

THE WORLD'S COTTON SUPPLIES

THE WORLD POSITION

It is characteristic of the cotton trade that it has always been liable to extreme fluctuations in the supply and the price of its raw material, and as the cost of the raw material normally accounts for more than 50 per cent of the value of the finished product, these fluctuations are a very serious hindrance to the carrying on of a steady trade satisfactory to all parties, grower, manufacturer, and consumer alike.

The outstanding cause of these fluctuations is that since about 1800 the world has drawn the bulk of its cotton supplies from one source, the cotton belt of the United States; and that supply has been exceedingly irregular, first because of wars, as in 1813-14, during the Civil War of 1861-65, and again during the Great War, and second because of the vagaries of the American climate and the depredations of insect pests, especially the boll-weevil. There have also, of course, been fluctuations due more to general world movements of prices, such as in 1894 and 1898 when American cotton was below 3d. per lb. in Liverpool, and, on the other hand, during the post-war boom of 1919-20, when it exceeded 30d. per lb. followed within twelve months by a reaction to nearly 6d. per lb. as the result of the deflation slump.

Since 1914 the world's supply of cotton has passed through a very critical period. Before the war the world's total crops were, on the whole, increasing fairly steadily, with the American crop leading the way. During the war all the world's crops suffered very severely, but it was hoped that when peace returned this would very quickly be remedied. It was so to some extent in 1919 and 1920; but from 1921 to 1923 the American crop passed through a succession of three calamitous years, which sent the price of cotton up again to very high levels, and gave every other potential cotton-growing country in the world the strongest possible incentive to increase its crop. In 1924, however, the American crop was comparatively large, mainly as the result of a record acreage, for the average yield was still one of the lowest on record. In 1925 these favourable conditions were again repeated, with the result that the crop established a new record, though very narrowly. As it happened, most of the other principal crops were also good in these two years, especially 1925, with the result that in that year the world's supplies exceeded the pre-war record of 1914. In 1926 the American crop beat all records, and for the first time since 1914 the world had ample, if not excessive, supplies. Thus the wheel had come full circle, and the trade was again faced with the prospect of a period of large supplies and low prices, which would inevitably produce the same reaction as formerly towards reduced acreage, smaller crops, and high prices again.

The facts of the world position as above outlined are summarized in Table I given on page 3.

In discussing the economic causes of these great movements in the world's supplies, it is necessary to keep in view that not only is cotton-growing spread over practically the whole of the sub-tropical areas of the world,

TABLE I
THE WORLD'S COTTON CROPS, 1902-1926
 Linters included in American Crop (as shown in brackets), 000's omitted throughout

	America (500 lbs. gross)	% of World Total	India (400 lbs.)	Egypt	Russia 500 lbs. approx.	China	Others	Total	% of 1914
1902-03	10,827 (196)	63	3,367	1,168	342	800	801	17,305	62
1903-04	10,046 (195)	61	3,161	1,302	477	800	751	16,537	59
1904-05	13,680 (242)	66	3,791	1,263	336	756	803	20,829	74
1905-06	10,805 (230)	61	3,416	1,192	604	788	938	17,743	63
1906-07	13,596 (322)	60	4,934	1,390	759	806	1,027	22,512	80
1907-08	11,375 (268)	62	3,122	1,447	664	875	950	18,433	66
1908-09	13,587 (345)	64	3,692	1,150	685	1,000	971	21,085	75
1909-10	10,315 (310)	54	4,719	1,000	663	1,419	950	19,066	68
1910-11	12,006 (397)	55	3,889	1,515	879	2,589	968	21,846	78
1911-12	16,251 (358)	64	3,288	1,485	873	2,552	1,038	25,507	91
1912-13	14,313 (610)	58	4,610	1,507	892	2,298	1,160	24,780	88
1913-14	14,795 (639)	57	5,066	1,537	980	2,303	1,287	25,968	92
1914-15	16,994 (857)	60	5,209	1,298	1,164	2,363	1,154	28,180	100
1915-16	12,123 (931)	57	3,738	961	1,407	2,057	984	21,270	76
1916-17	12,781 (1,331)	58	4,489	1,022	1,110	1,714	1,027	22,143	79
1917-18	12,428 (1,126)	59	4,000	1,262	603	1,863	1,086	21,242	76
1918-19	12,970 (930)	59	3,972	964	420	2,203	1,298	21,827	78
1919-20	12,029 (608)	53	5,796	1,114	274	1,914	1,485	22,612	81
1920-21	13,880 (440)	64	3,600	1,206	121	1,667	1,406	21,880	78
1921-22	8,351 (398)	51	4,485	972	57	1,263	1,311	16,439	59
1922-23	10,370 (608)	52	5,073	1,243	50	1,884	1,502	20,122	71
1923-24	10,808 (669)	52	5,161	1,306	212	1,747	1,744	20,978	74
1924-25	14,525 (897)	55	6,088	1,455	471	1,880	2,001	26,510	95
1925-26	17,219 (1,115)	58	6,250	1,593	733	1,827	2,207	29,829	106
1926-27	18,977 (1,000)	62	4,973	1,800	850	1,667	2,408	30,475	108

Estimates in heavy type.

under climatic conditions which vary from the aridity of Egypt and the Sudan to the monsoon conditions of India, and the heavy rainfall of parts of the West Indies and Central America, but also that cotton is not a homogeneous article, but is of many different varieties, varying enormously in quality and price as well as in the purposes for which they are mainly suitable. The Liverpool Cotton Association's weekly circular quotes 34 different varieties, of which the prices on 1st October, 1926, ranged from 4½d. to 42d. The first necessity, therefore, is to adopt some broad classification of all these different kinds of cotton, and this is attempted in Table II (page 5), which is divided into three main grades. Incidentally, it also shows the British Empire's share in each grade, and compares the position in 1925-26 with pre-war averages. On this comparison Grade I shows an increase of about 20 per cent, all at the lower end of the Grade; Grade III (short staple) shows a slight fall on the whole, but the greatest change is in Grade II, where almost every item shows an increase, but India most of all.

It is obvious that the American crop dominates the whole position, and Table I on page 3 shows its proportion of the world's total. Before the war it was normally about 60 per cent, but had been as high as 66 per cent. During the war it ranged from 57 per cent to 59 per cent, but in 1920 it was 64 per cent again, partly because others were very low that year. In 1921 it fell to nearly 50 per cent, and 1922 and 1923 showed but a slight recovery. 1924 and 1925 still showed only 55 per cent and 58 per cent of the total because all the others were increasing too, and even 1926, though the largest American crop on record, was only 62 per cent. All this emphasizes the rapid increase of the other sources of supply since the low-water mark of 1920, when

TABLE II
CLASSIFICATION OF THE WORLD'S COTTON CROPS

Variety	Where Grown	Length of Staple	Approx. Crops		British Empire
			Pre-war Average	1925-6	
Grade I, Fine		inches	500	lb. Bales	000's
Sea Island	S. Carolina, Georgia, and Florida	1½-2	90	—	—
	West Indies British	" "	6	4	4
	" " Others	1½-1½	10	20*	—
Egyptian—Sakel, Afif, etc.	Lower Egypt	1½-1½	1,100	850	850
Ashmouni, etc.	Upper and Lower Egypt	1½-1½	400	750	750
Pima	Arizona	1½-1½	—	20	—
Sudan	Tokar, Gezira, and Kassala	1½-1½	20	100	100
Peruvian	Peru	1½-1½	100	200	—
Brazilian	Northern Brazil	Up to 1½	100	200	—
American (long staple)	Mississippi, S. Carolina, etc.	1½-1½	200	500	—
	TOTAL, GRADE I		2,026	2,644	1,704 = 65%
Grade II, Medium American					
	United States (excluding linters)	1-1½	14,000	15,600	—
	Mexico	1-1½	130	200	—
	Brazil	1-1½	300	400	—
	Other S. America	Up to 1½	20	230	—
	British Africa, E. and S.	"	50	200	200
	Nigeria	"	10	40	40
	Africa (non-British)	"	10	75	—
	Australia and Iraq	"	—	15	15
	India (long staple)	1-1	300	2,000	2,000
	Russia (long staple)	Up to 1	250	250	—
	Others	"	200	200	10
	TOTAL, GRADE II		15,400	19,210	2,265 = 12%
Grade III, Short					
	India (short staple)	} 1-1 }	4,000	4,000	4,000
	Japan, Korea, etc.		50	200	—
	East Indies		70	25	—
	Russia (short staple)		750	500	—
	China		2,000	1,750	—
	Persia		130	100	—
	Europe and Asia Minor		175	235	10
	TOTAL, GRADE III		7,175	6,810	4,010 = 59%
	GRAND TOTAL		24,601	28,664	7,979 = 28%

* Mostly Marie Galante.

India, Russia, and China all happened to be bad, but it also brings out the fact that the fluctuations of the American crop from year to year are so great that they may easily counteract the total effect of any changes that take place in all the other crops put together.

The best way to obtain a general view of the history of the American crop is by a long record of the average yield per acre, as shown in the inset diagram with a "smoothed curve" of five-year averages. It will be seen that there are three main periods (1) from 1870 to about 1884, when the yield was on the whole falling—the aftermath of the Civil War, (2) 1885 to 1914, with the yield rising—due mainly to improved methods and the extension of cotton cultivation to virgin land in the Western States, (3) 1915 to 1919, a succession of poor years followed by a partial recovery in 1920, and then by a succession of three calamitous failures due mainly to boll-weevil, followed by a gradual recovery in 1924–26.

To find out the causes of these movements we must study the economic conditions under which cotton is grown, first in America and then elsewhere.

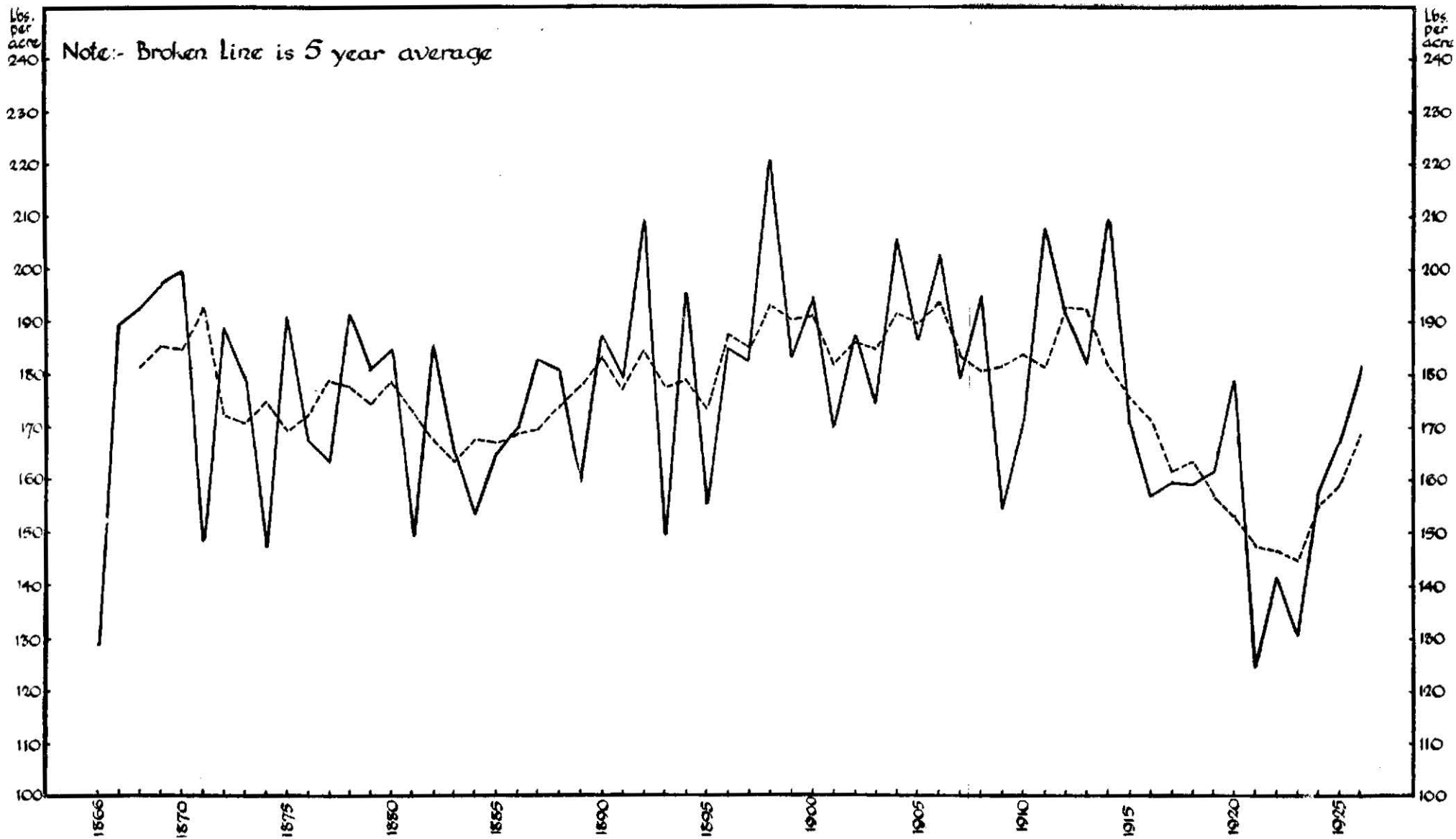
Cotton belongs to the *Malvaceae* or Mallows. Its scientific name is *Gossypium*, and its nearest relation in English plant life is the hollyhock, which it sometimes resembles in certain respects. As a rule, however, it is a low-growing plant, more like a gooseberry bush than a raspberry, but it varies enormously from "bumble bee" cotton, only 9 to 12 in. high, to Pima, which sometimes grows 9 or 10 ft. high, and tree cotton even higher. All the many varieties of cotton may be briefly classified into two groups.

(a) Old world or Asiatic cottons.

(1) *Herbaceum*—India, Levant, Russian Turkestan, Persia.

(2) *Arboreum*—tree cottons.

AMERICAN COTTON CROD Average Yield per Acre since 1866



(b) Two groups found mostly in the American continent, south as well as north—

(1) *Hirsutum*—Upland.

(2) *Barbadense*—Peruvian, Sea Island, Egyptian, etc.

It is unnecessary to go into botanical details as to the differences of leaf, flower, etc., but the differences in the seed may be noted, i.e. between the white or fuzzy seed of American cotton, and the black or clean seed of Peruvian, Sea Island, Egyptian, etc. In addition to the real lint, which is the commercial cotton, the white seeded varieties also carry a short fuzzy lint, which is not removed in the process of ginning (separating the cotton from the seed), but is taken off by a subsequent process, and is known as "linters." During the war the supply of these was greatly increased by closer cutting, owing to the demand for gun cotton purposes, and they are now again in request as the raw material for artificial silk and other forms of cellulose.

Cultural details, e.g. dates of planting, etc., may also be omitted, but an important question is that of the root system. Cotton is a very deep rooted plant. In addition to the ordinary surface system of small roots it develops under favourable conditions a tap root which may go 6 to 9 ft. into the ground. This adds greatly to its power of resisting drought.

The conditions required for the growth of cotton may be classified as *Climatic* and *Economic*. Cotton may be grown either as an annual, resown every year, or as a perennial, being cut back each season (ratooning), and allowed to grow again from the same root, or in some cases it is allowed to grow for a few years or even permanently in tree form. The climatic conditions may be classified as (a) rainfall or monsoon conditions, and (b) irrigation. We shall describe first the growing of annual cotton under rainfall conditions, these being

the commonest conditions throughout the world, and typified by the American crop.

The growing season is about four to six or even eight months, according to the temperature and the variety grown, but the harvesting season may be very long drawn out, as in America. The principal operations in growing cotton may be described as follows—

Preparation and planting require sufficient moisture, but excessive rain is harmful, e.g. in the Atlantic States elaborate precautions have to be taken to prevent erosion of the fields by torrential rains.

Chopping or "cultivation" includes thinning out and weeding. It requires dry weather and a large supply of labour. During the growing season the plant requires a moderate rainfall, though cotton stands drought wonderfully. The growing period is ended by the first killing frost.

Picking requires fine weather. Rain not only stops picking at the time and afterwards until the cotton is dry, but also lowers the grade. Picking requires a very large amount of hand labour.

Ginning and baling is really the first manufacturing process. It requires large organization, because a ginnery will not pay without a turnover of at least a few thousand bales each season, and the capital involved is considerable.

Marketing, including transport, again requires a large organization and considerable circulating capital.

The total area of the American cotton belt is about 700,000 square miles, or six times that of the United Kingdom, but only about 11 per cent of the area is actually under cotton (1926, 49 million acres out of, say, 450 millions).

Cotton is grown in 19 States out of the total of 49

Table III gives them in geographical order, with the acreage and average yield for 1914, and for each year since 1919. The following are the main divisions of the Belt with the chief ports of each State ; but these divisions overlap to some extent as indicated.

<i>Atlantic States—</i>		<i>Ports—</i>	
Virginia		Norfolk	
North Carolina		Wilmington	
South Carolina		Charleston	
Georgia		Savannah & Brunswick	
Florida		Jacksonville & Pensacola	
<i>Gulf States—</i>			
Alabama		Mobile	
(Mississippi)			
Louisiana		New Orleans	
(Texas)			
<i>River or Valley States—</i>			
Northern Mississippi			
Arkansas			
Tennessee			
Missouri			
<i>Texas Group—</i>			
Oklahoma			
Texas		Galveston & Houston	
New Mexico			
<i>Western—</i>			
Arizona }		San Diego	
California }			

In the Atlantic States rainfall is usually ample, and the heat is not excessive. Drought is exceptional, the atmosphere being generally humid, especially near the seaboard, where frosts are very mild, unlike the inland parts of the U.S.A., where the winter, even in the south, can be very severe. In the Gulf States the southern portions near the sea are like the Atlantic States ; the northern portions have a more continental climate, i.e.

TABLE III
AMERICAN COTTON CROP—ACREAGE HARVESTED AND YIELD PER ACRE

States	Weevil Dates		1914-15		1919-20		1920-21		1921-22		1922-23		1923-24		1924-25		1925-26		1926-27		
	(a)	(b)	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	Area	Yld.	
			ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres	lb. acres	ooo acres
Virginia	1928	1923	45	868																	
North Carolina	1919	1922	1,847	290	1,492	266	1,527	275	1,423	264	1,623	250	1,679	260	1,623	266	1,627	268	1,963	293	1,963
South Carolina	1917	1920	8,361	233	7,835	240	8,964	200	8,571	189	10,118	183	9,903	187	8,404	160	8,054	160	8,048	163	8,048
Georgia	1914	1919	5,433	219	5,222	138	4,922	138	4,172	90	3,418	100	3,481	88	3,040	157	3,059	153	3,005	121	3,005
Florida	1910	1916	821	175	103	74	100	86	65	89	118	108	147	40	101	120	101	120	105	140	105
Alabama	1909	1915	4,007	209	3,791	188	3,858	111	3,235	124	3,271	148	3,079	01	3,053	154	3,194	185	3,051	190	3,051
Mississippi	1907	1914	3,094	195	3,648	100	3,050	145	3,028	148	3,014	157	3,170	01	3,081	176	3,406	275	3,258	240	3,258
Louisiana	1903	1907	1,809	165	1,527	93	1,427	93	1,108	114	1,140	144	1,405	123	1,616	146	1,474	238	1,079	201	1,079
Tennessee	1915	1921	915	200	728	108	840	128	634	222	685	193	1,172	02	906	179	1,173	210	1,143	198	1,143
Missouri	1921	1922	143	270	125	237	136	375	123	328	298	361	353	171	493	167	563	271	434	240	434
Arkansas	1926	1916	2,421	196	2,795	133	2,026	193	2,322	125	2,799	171	3,020	02	3,094	169	3,232	220	3,790	196	3,790
Oklahoma	1923	1919	2,447	212	2,424	193	2,749	239	2,226	104	2,015	193	3,107	07	3,661	167	3,814	153	4,070	121	4,070
Texas	1910	1910	11,021	194	10,476	140	11,692	174	10,745	02	11,274	130	12,150	147	17,175	138	17,022	113	16,374	147	16,374
New Mexico																					
Arizona																					
California																					
Others																					
TOTAL			36,832	209	33,560	162	35,872	172	30,509	125	33,036	142	37,123	131	41,302	152	46,033	167	47,027	125	47,027

(a) Weevil first reported,
(b) State virtually covered.

Included in others.

drier and with greater extremes of temperature. In the Mississippi Valley the rainfall is ample, and the parts adjoining the river frequently suffer from flooding, as in the spring of 1927. Texas is itself so large a State that there are great variations within its enormous area. It often suffers from torrential rains, and at other times is very hot. Drought is frequently severe, especially in the middle part of the State. In the extreme northwest the new districts of the Panhandle and the Plains have shown large extensions of cotton area in recent years, but they suffer from one drawback that when drought does come it is extremely severe. In the western States, Arizona and California, there is practically no rainfall at all, and cotton is grown mainly under irrigation.

Under the old conditions the varieties of cotton grown in the U.S.A. were distributed roughly as follows—

In the *Atlantic States*, Upland or "Bowed," so called from the ancient method of ginning by hand with the bow, and Sea Island, of which the very best was the real "Islands," grown on the so-called Islands on the coast, and divided into "crop lots" and "graded" cotton. Next to these came Floridas and Georgias, grown inland, but from Island seed renewed every year. The whole Sea Island crop, however, practically disappeared from 1919 owing to boll-weevil.

Gulf States. Orleans cotton was really just Uplands, but grown under more favourable conditions.

Mississippi Valley. The long staple cottons, formerly grown south of Memphis in the Delta of the Yazoo and Mississippi rivers were known as "Peelers" and "Benders." There seems to be some doubt whether these really were of Upland origin, as black seed was occasionally found.

Texas cotton is again just improved Upland cotton,

the staple being better, probably owing to virgin soil and better cultivation.

Nowadays, however, there are so many new varieties and new names for cotton that the best classification is by staple as follows—(a) about $\frac{3}{8}$ in., mainly in the Atlantic States. There is some even shorter, e.g. "Half and Half," a variety of East Indian origin, so called because it gives an enormous ginning outturn, or percentage of lint to seed cotton, sometimes, it is said, as high as 50 per cent, as against the normal 30 to 33 per cent. It was found specially suitable for mixing with wool, but is frequently no more than half an inch in staple, and otherwise very undesirable cotton. (b) Cotton of about an inch staple is widely distributed over the whole cotton belt, and amounts to a considerable proportion of the whole crop, but it is impossible to make any statistical estimate of the relative amounts. According to a Government return in 1920, 90 per cent of the whole crop was described as "under $1\frac{1}{8}$ in." (c) $1\frac{1}{8}$ in. Texas is the best of ordinary American cotton. It is now grown also in many other States.

Three great changes in regard to the quality of the American crop have taken place in recent years. The first was the loss of the Delta staple cottons, due to the boll-weevil which invaded the Delta about 1910. This was followed by the invasion of the Sea Island country in 1918. In both cases the result was the immediate disappearance of the longer staple. In South Carolina an attempt was made to replace Sea Island by a long staple early maturing upland variety named Meade, but this seems to have met with little success. The second was the introduction of new staple Upland varieties combining the heavy yield of the big balled Upland varieties with improved staple. The first of these was Durango, grown from a single boll found at

the St. Louis Exhibition in 1904, but there are now many varieties, e.g. Webber, grown originally in Hartsville (South Carolina), and others in favourably situated districts, such as Paris (North Texas), and, of course, the Mississippi Delta area. The improvement of staple seems to be more a question of favourable climate and soil and careful seed selection than of botanical origin. The third was the introduction of Egyptian cotton into Arizona and California. Pima (American-Egyptian) cotton, grown under the community system in the Salt River Valley, was a remarkable success, but owing to difficulties of cultivation, smaller yield and greater difficulty of picking it required a high premium to make it profitable, and the disappearance of the Egyptian premium in 1923-24 practically drove it out. Its partial return since has had to face great difficulties in maintaining the purity of the crop after it has once been mixed.

Cotton was certainly indigenous to the whole continent of America, north and south, but the modern Upland cotton was probably imported about the seventeenth or eighteenth century—it is suggested from Cambodia by the French, who were then in Louisiana. The cultivation of cotton is first reported in Virginia in 1621, when the price was 8d. per lb., and in South Carolina and Georgia in 1733. At first exports were very small, the first recorded being from Virginia in 1739. The invention of the saw-gin by Eli Whitney in 1793 led to very rapid development till the time of the Civil War. The crop grew up with slave labour, and as the result of the Civil War and its aftermath its development was severely checked for many years. After 1883, the acreage increased rapidly, and Table IV gives the figures since 1899.

TABLE IV

AMERICAN ACREAGE, CROP, YIELD PER ACRE, AND PRICE, 1899-1926

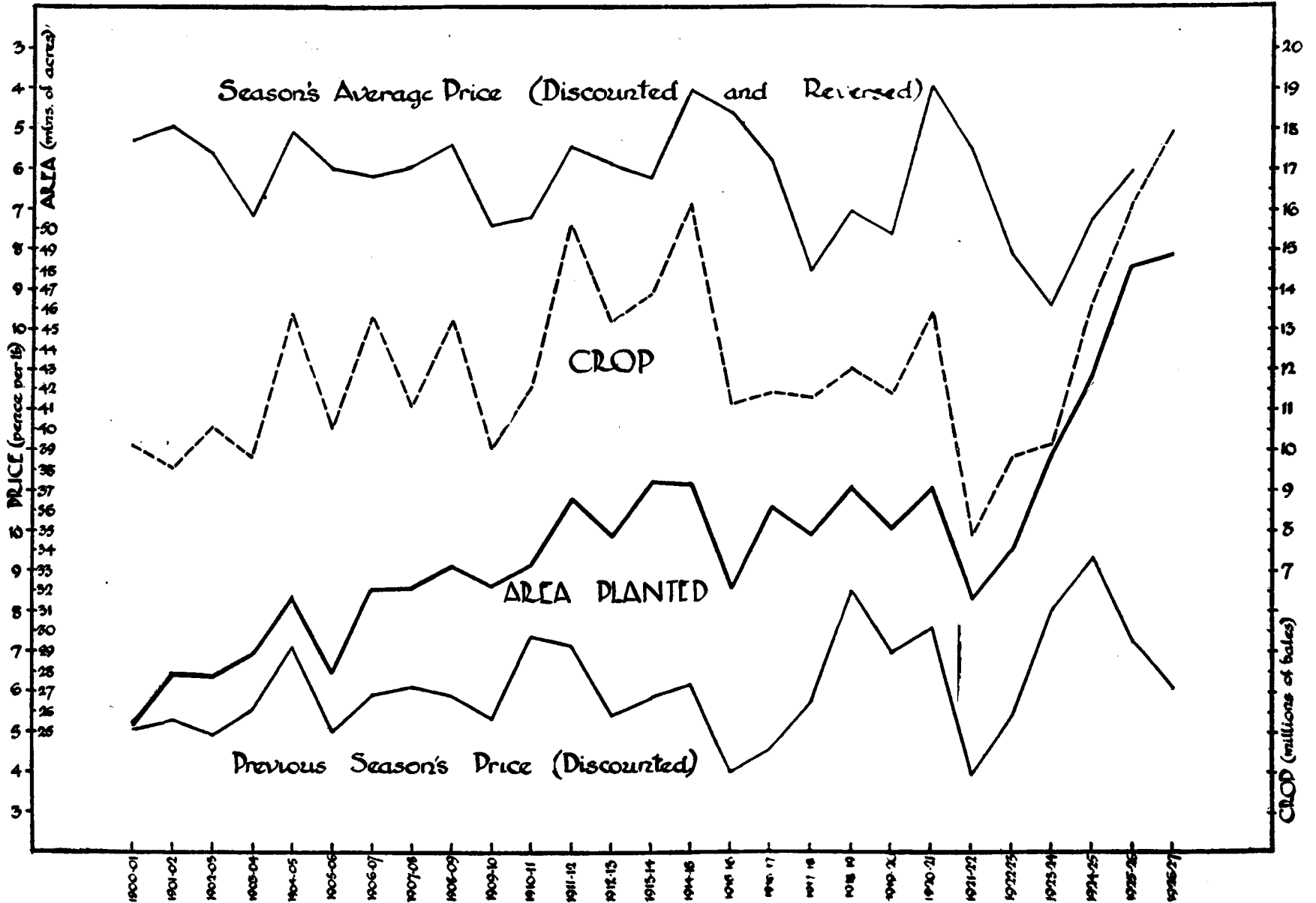
Season	Acreage, Harvested, 000 Acres	CROP			Average Yield, lb. per Acre (ex. linters)	Average Price Middling, Pence per lb.	
		(Running Bales 000's)				Actual	Discounted
		Cotton	Linters	Total			
1899-1900	24,275	9,393	115	9,508	183.8	4.87	5.07
1900-01	24,933	10,102	144	10,246	194.4	5.16	5.26
1901-02	26,774	9,583	166	9,749	170.0	4.78	4.95
1902-03	27,175	10,588	196	10,784	187.3	5.46	5.64
1903-04	27,052	9,820	196	10,016	174.3	6.94	7.11
1904-05	31,215	13,451	246	13,697	205.9	4.91	5.02
1905-06	27,110	10,495	231	10,726	186.6	5.95	5.98
1906-07	31,374	12,983	322	13,305	202.5	6.38	6.17
1907-08	29,660	11,058	268	11,326	179.1	6.19	5.92
1908-09	32,444	13,086	346	13,432	194.9	5.50	5.31
1909-10	32,044	10,073	313	10,386	154.3	7.86	7.38
1910-11	32,403	11,568	398	11,966	170.7	7.84	7.19
1911-12	36,045	15,553	556	16,109	207.7	6.09	5.43
1912-13	34,285	13,489	602	14,091	190.9	6.76	5.84
1913-14	37,089	13,983	631	14,614	182.0	7.26	6.21
1914-15	36,832	15,906	832	16,738	209.2	5.22	4.00
1915-16	31,412	11,068	945	12,013	170.3	7.51	4.55
1916-17	34,985	11,364	1,300	12,664	156.6	12.33	5.75
1917-18	33,841	11,248	1,096	12,345	159.7	21.68	8.50
1918-19	36,008	11,906	910	12,817	159.6	19.73	7.00
1919-20	33,566	11,326	595	11,921	161.5	25.31	7.64
1920-21	35,878	13,271	429	13,700	178.4	11.89	3.99
1921-22	30,509	7,978	382	8,360	124.5	11.37	5.48
1922-23	33,036	9,729	591	10,320	141.5	14.92	8.07
1923-24	37,123	10,171	640	10,811	130.6	17.66	9.22
1924-25	41,360	13,639	858	14,497	157.6	13.76	7.25
1925-26	46,053	16,123	1,044	17,167	167.2	10.77	6.02
1926-27	47,087	17,755	1,000	18,755	182.5	—	—

Estimates in heavy type.

The main facts of the crop history since 1901 are also shown in the diagram inset, which, however, is based on the figures of acreage planted instead of acreage harvested, and in order to eliminate the inflation of prices during the war period the whole of the prices

AMERICAN COTTON CROP

Price, Acreage and Crop since 1900



given have been carried back to the level of 1900, i.e. they are discounted by the rise in prices since that date. Examination of the table and diagram shows that both area and crop were increasing pretty steadily till 1914, but prices (even discounted) were rising, because the potential demand was increasing still faster than the supply. This was due to the fact that the world's population was increasing and the standard of living rising, especially in countries such as India, which had large crops to export at rising prices, such as tea, jute, cotton, and wheat. Again, as the result of improved processes, e.g. mercerizing, schreiner, and raising, cotton fabrics could be produced of a very much higher quality and appearance than before, and this enabled cotton to displace flax, wool, silk, etc., especially in the middle class trade. Entirely new uses for cotton were also becoming important, such as aeroplane and tyre fabrics.

Even before the war, however, the rate of increase both of area and of crop was slowing down, and there was a very noticeable development of severe fluctuations in the acreage from year to year. The diagram shows that these fluctuations corresponded very closely with the fluctuations of the previous season's price. The see-saw movement was really a vicious circle due to the fact that many of the planters were finding the cost of production so high that the price did not always leave a sufficient margin to make cotton-growing profitable. Thus one big crop meant a fall in price, which led to a reduction of acreage next year and, other things being equal, to a smaller crop and higher prices, which brought the acreage up again in the third year, followed in many cases by a big crop once more, and the resumption of the circle. Correlation between the area each season, and the price of the previous season was very close,

especially in the post-war years, but the record areas of 1925 and 1926 were apparently inconsistent with the fall of prices. This might be explained by the general belief that the enormous increase of acreage in these years was partly a matter of statistical adjustment owing to the improved methods of the Department of Agriculture in estimating the acreage, but the more probable explanation was that the increased yield per acre in 1924 and 1925, due to the comparative absence of boll-weevil, helped to set off the fall in price. When, however, in the autumn of 1926 cotton went below pre-war prices it seemed inevitable that a reduction of acreage must follow.

The causes of the increased cost of production even before the war were, first, the general rise of prices from which the U.S.A. suffered fully as much as other countries owing to its high tariff policy. The farmers also complained that the cost of everything they required was increased by the trusts and combines formed in the interests of the industrial population. But the great item was the increased labour cost. Cotton requires intensive cultivation and a great deal of labour, especially in cultivation and picking, and the increase of area in Texas and the west had overtaken the available labour supply. In the old days the picking rate used to be 50 to 70 cents per 100 lb. of seed cotton, or about three times as much per 100 lb. of lint. In 1913 the rate in Texas was about 85 cents per 100 lb. ; in 1919 it rose for a time to 175 cents. After 1920 there was, of course, a reaction, but in spite of organization to bring in temporary supplies from outside, e.g. Mexicans in Texas, the difficulty is always acute with a big crop. Attempts to produce a cotton-picking machine have not so far been successful, partly because the crop does not ripen all at once and the machine not only damages unripe

bolts but also breaks leaf, bracts, etc., into the open cotton, lowering its grade. It is doubtful, also, whether the cost of operating the machine, including capital cost, was really less than hand picking.

A new development in recent years has been the introduction of snapping, or breaking off the whole boll, and in 1926 this was developed still further, by the adoption in the western districts of Texas of a machine for this purpose called the "Sled." The bolls are afterwards emptied by special machines at the ginnery. The grade of the cotton is lowered, but owing to improved cleaning operations it is said this now involves less loss than is saved in the reduced cost of picking and the ease with which the crop can be gathered before it is damaged by rain.

The labour situation in the United States was greatly changed by the war demands and the migration of negroes, in the first place to the northern towns for war industries, and latterly to their own local towns for small industries, and especially to the cotton mills which were then migrating south. The fact is that the conditions of the small negro planter's life were so unattractive, and the money yield of the crop so uncertain owing to the weevil and the fluctuations of prices that, combined with the high cost of living, cotton-growing ceased to be attractive, until the high prices of 1923 reversed the position and brought new records of acreage, especially in the west.

The reduction of yield, which played so large a part in increasing the cost of production per lb. of cotton, was largely due to the boll weevil. This terrible pest, which was first reported from Mexico in 1862, crossed the Rio Grande river into Texas in 1892, and from then till 1923 made practically uninterrupted progress northwards and eastwards across the belt. Table III shows the dates

(1) when it was first reported in each State, and (2) when the state was reported as covered ; and it is interesting to compare these dates with the fall of the average yield in each case. It is remarkable that in many cases the record yield was just about the year in which complete infestation was reported, this being followed very quickly by a sharp reduction. As to the amount of damage done throughout the belt by the weevil, up till 1921 the Department published figures which in that year showed an estimated loss of 109 lb. per acre from insect pests, most of this being due to the weevil. Since then the Department's figures have been given in the form of a percentage reduction from the full yield, and on this basis the loss has fallen from 35.4 per cent in 1921 to 12 per cent in 1924, and only 6 per cent in 1925.

The weevil hibernates in the old cotton stalks or other dead wood, and reappears in the spring in time to attack the first "squares" or flower buds forming on the cotton plants. The female punctures the square, or later the small boll, plants an egg in the hole, and seals it up. The young grub eats out the heart of the square or boll, which dies and generally falls to the ground. The life cycle of the weevil is repeated many times during the summer, and its powers of multiplication are enormous, so that by July or August it becomes sufficiently numerous to do great damage ; hence the importance of early maturing cotton or an early crop, because the weevil does not attack the tough ripe boll if it can find others.

As to possible remedies, if preventive measures had been adopted in the early days in Texas, as was done later, and apparently effectively, in the case of the pink boll worm, it might have been localized, if not exterminated ; but now that it has secured a good hold throughout the belt, the methods of destruction are far from easy. Better cultivation, such as pulling up the

old cotton stalks at the end of the season, clearing vegetation from the land surrounding the cotton fields, gathering and burning the affected squares or ploughing them under, would all do a great deal to check the multiplication of the pest; but the most effective remedy so far discovered is poisoning with calcium arsenate in a very fine powder. The application of this remedy, however, involves an immense amount of labour, for to be effective it must be done most thoroughly under favourable climatic conditions, and at least six times during the season. The actual cost of the poison, and the labour cost of applying it are so heavy that it is quite beyond the reach of many of the small planters, and it would probably not pay unless the crop promises a fairly good yield and of reasonable quality. Many other methods of applying the poison more easily have been tried, but with no definite success. Poisoning on a large scale by aeroplanes has also been experimented with, but under existing conditions as to small ownership of the crop, the difficulties are at present very great, and altogether only a very small proportion of the total area has ever been effectively handled.

There are still considerable areas on the fringes of the belt which have not been affected by the weevil, especially the drier areas of West and North-west Texas and New Mexico, and, of course, California and Arizona, but in 1924 there were reports of the discovery of a different species of the weevil there which seemed to survive even under these conditions.

The years 1921, 1922, and 1923, which marked the height of the weevil's activity, had given rise to the fear that the enormous damage done in these years was likely to prove normal in future, but 1924, with a different set of conditions, seemed to alter the whole circumstances, and gave rise to the hope that the boll-weevil had at

last been overcome. Heavy frosts during the winter of 1923-24 had considerably reduced the emergence of the pest in spring, and a severe drought in Texas with hot weather in other parts greatly reduced the rate of multiplication during the summer. When the drought broke just in time to save the crop, the weevil was so far behind its normal quantity that the damage was greatly minimized. In 1925 the droughty conditions were repeated throughout an even larger area, with the result that again the damage done by the weevil seemed almost negligible. In 1926 conditions were apparently much more favourable to the weevil, yet again very little damage was done by the pest. It would, however, be optimistic to assume that this state of affairs will be repeated in future seasons; in fact the moral of these six seasons seems to be that given conditions suitable to the weevil, as in 1921, 1922, and 1923, there is almost no limit to the damage it may do; but given the opposite conditions, as in 1924, 1925, and 1926, the damage may be reduced very greatly.

If the weevil cannot be exterminated, the only other method of combating it is to grow early maturing varieties, which will make a fair crop in early autumn before the weevil becomes too numerous. This raises the question of seed selection. Until the beginning of this century practically nothing had been done in this direction in America except in the Sea Island and Mississippi long staple districts, where the best planters took great care of their seed supply. Recent developments due to the search for early maturing varieties have, however, greatly stimulated the use of scientific methods in the search for improved cottons. This has been mainly along two lines: (a) selection of the best plants out of existing strains, and (b) the deliberate crossing of different strains to combine the good qualities of both. It is

comparatively easy to get new varieties, but it is very difficult to maintain the purity of a new or selected variety owing to the extraordinary facility of the cotton plant for natural crossing. Pure seed, however, is of the utmost importance, because uniformity of staple depends almost entirely on a pure crop. It requires constant supervision to prevent mixing of seed, and to keep the crop pure by "roguing" out of the fields any plants that are not true to type. Special care is also required in ginning to keep the seed of different types apart, as well as, of course, to prevent the mixing of different staples. Under commercial conditions success in these directions has very rarely been achieved except where, under the community system, as in Salt River Valley, only one type of cotton is grown in the whole district.

The handling and marketing of the American crop still offer great scope for improvement. In the old days the ginneries in the Atlantic States were very primitive, but the modern ginneries which are now general throughout the belt are excellent, the handling of the cotton being almost entirely automatic throughout. The usual type of press in these ginneries produces a very satisfactory bale, and the cause of the trouble with regard to the condition of the American bale as it reaches the consumer lies entirely in the habit of cutting the outer covering for samples. This excessive sampling, a new hole being cut every time, necessitates the addition of sample patches when the bale is repressed for export at the compress. This process is very badly done owing to the extraordinary rush during the short season, with the result that the bale even when fresh from the compress is very poorly covered, the bagging not being properly drawn together or sewn up. The result is the disgraceful condition of the American bale as it is known

in every country. It is easy to suggest remedies, such as higher compressing at the ginneries, with certified samples taken out of the press box before the bale is made, but tradition and vested interests are very difficult to overcome.

In marketing, also, the system leaves a great deal to be desired. In the country districts cotton is bought mostly on the "village price," which is practically the same for all cotton, allowing something for grade, but very little for staple. The growers often do not know the value of their crop, and the business of the local buyer is to pay the smallest price possible, which greatly discourages all efforts to secure the growing of improved varieties. In the past the financial position of the small growers has been very weak, and they were forced to sell at once, frequently to or through their own creditors for stores. In this respect there has been a great improvement in recent years, which has been largely assisted by the development of the growers' co-operative associations throughout the belt. They have done much to secure more orderly marketing of the crop throughout the season, thus checking the pressure to sell in the early part of the season, and tending to secure better average prices for the growers.

OTHER CROPS

The term, "Outside Growths," is frequently used in Liverpool as meaning everything except American, but it is better to exclude Indian and Egyptian, which have their own separate and well established markets, leaving only those other growths which have in recent years been used in place of American, and which are detailed in the following table. Indian, Egyptian, and also the large Russian and Chinese crops were included in the table of the world's crops on page 3. Apart from

TABLE V
SUMMARY OF THE SMALLER COTTON CROPS, 1914-26
 In 000's of 500 lb. bales approximate

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
<i>Foreign Crops—</i>													
Brazil	406	296	341	413	486	552	424	483	519	544	630	596	600
Peru	123	115	128	130	136	183	104	183	185	196	193	187	200
Mexico	112	100	106	110	237	203	220	169	186	168	288	198	396
Other South American	14	13	13	19	21	20	56	62	65	144	165	227	225
West Indies	13	15	11	11	12	16	13	22	17	17	18	18	20
Japan and Korea	68	63	63	79	92	118	127	128	205	197	183	190	200
East Indies, etc.	71	69	77	73	68	90	67	36	26	22	23	24	25
Persia	131	127	91	72	66	84	73	68	75	91	93	105	100
Europe and Asia Minor	148	123	130	117	108	125	116	52	64	116	144	235	250
Africa	3	3	7	5	6	12	13	18	25	48	68	76	80
TOTAL	1,089	924	967	1,029	1,232	1,403	1,273	1,221	1,367	1,543	1,805	1,856	2,096
<i>Empire Crops—</i>													
Sudan	8	19	13	19	13	18	24	19	23	38	36	103	115
Uganda	29	21	19	20	29	38	65	39	70	103	157	145	104
Other East and South													
Africa	6	7	7	4	4	5	13	13	15	25	42	46	50
Nigeria, etc.	12	6	16	10	14	13	24	12	14	20	32	40	25
Iraq	—	—	—	—	—	—	—	—	—	1	2	2	3
Malta and Cyprus	5	3	2	2	1	3	2	2	1	2	3	3	3
Australasia	—	—	—	—	—	—	1	2	8	9	11	8	8
West Indies	5	4	3	2	5	5	4	3	4	3	3	4	4
TOTAL	65	60	60	57	66	82	133	90	135	201	286	351	312
GRAND TOTAL	1,154	984	1,027	1,086	1,298	1,485	1,406	1,311	1,502	1,744	2,091	2,207	2,408

direct substitution, however, especially in Lancashire, the existence of large crops such as the Indian, Russian and Chinese, though mostly of a quality well below that of American, helps to relieve the pressure of the world's demand on the American crop, e.g. Japan can use either Indian or American, according to the price, while China and India can use home-made goods, or goods made in the local factories from native cotton, as against Lancashire imported goods. Again, in West Africa and most parts of South America, as well as India and China, a large proportion of the local grown cotton goes into purely domestic consumption, which means less need for imported goods.

Of the old-established fields mentioned in Grade II of the Classification Table on page 5, *Brazil* (approximate crop 600,000 bales) is one of the oldest cotton fields in the world, dating back before the European conquest. Brazilian cotton was largely used in England before American was known here, and from 1781 till 1800 it was our chief source of supply. The possible area for cotton growing is immense. The actual crop is not known, partly because of the irregularity of the bale weight, and partly because of domestic consumption; only the mill consumption is known through the International Federation statistics. In any case the actual crop is no measure of the enormous potentialities of the country, which it has been said might reach 20 million bales. The cotton-growing areas are widely scattered, forming a broad belt all round the Atlantic coast, except the Amazon Valley. The two chief groups of cotton districts are (a) in the south, e.g. San Paulo, where the rainfall is generally sufficient, and indeed in the coastal districts too much. The varieties grown are mostly of American quality, and are largely used in the local mills. (b) In the north drought is frequent,

with the result that tree cottons prevail, because in addition to their resistance to drought they require less labour, there being no annual planting, and picking being spread over the whole season. The varieties chiefly grown are indigenous cottons of the black seeded type allied to Barbadosense. The staple is good, sometimes reaching even $1\frac{1}{2}$ in.

Very high yields seem to be characteristic of Brazil, reports going as high as 1,200 lb. per acre, and 500 lb. seems quite moderate, but according to the statistics, the average yield for the whole country is less than 200 lb. per acre. The growing season is said to be very short. Pests are apparently not serious, even among the tree cottons. There is no boll-weevil, and the pink bollworm is said to be easily controlled by exposing the seed to the sun before planting.

The full development of the possibilities of the country is limited by the insufficient labour supply, which is mostly native Indians. Wages are low and methods primitive, and the handling of the crop is generally unsatisfactory. Seed selection is little practised, and the methods of picking, ginning, and baling require great improvement. Capital for agricultural machinery, railways, and ginneries, as well as political security and the necessary organization, are all lacking.

Peru (crop barely 250,000 bales) is also one of the old cotton-growing countries of the world. The total area is comparatively small, being confined mainly to the irrigated valleys on the Pacific coast. The climate is comparatively mild owing to the Humboldt current. Most of the crop is perennial or tree cottons, the real native type being the old rough Peruvian, specially favoured for its facility in mixing with wool. Smooth Peruvian used to be about two-thirds of the total crop, but had largely been replaced since 1918 by Tanguis.

Certain Egyptian varieties have also been acclimatized successfully, though they have deteriorated. The staple of all these varieties is good, some of them running to $1\frac{1}{2}$ in. and possibly more. Like Brazil, Peru boasts of very high average yields, and also virtual immunity from insect pests; even the pink bollworm, it is said, does not do much damage. The organization of the industry is, on the whole, very good, being mainly in the hands of large European firms.

There is room for extension in the Pacific coast valleys if further funds were available for irrigation schemes. In the Trans-Andine area, however, sloping eastwards to the Amazon basin, there are very large areas for possible cotton growing, but transport to the Atlantic is slow and expensive.

Mexico (crop about 200,000 bales) is also a country of great potentialities but very small achievements. Its total area is more than that of the whole American Belt, and much of it could be made available for cotton growing, with irrigation where necessary. Small cotton areas are very widespread, e.g. in the Rio Grande Valley, in Durango, and other provinces on the Eastern slopes, in the southern parts of the Imperial Valley (Old California), and all down the Pacific coast line. The climate varies greatly in different parts; cotton is mostly rain-grown, but there are many rivers which could be developed for irrigation. The population is sufficient for a large development of cotton growing. The cotton is generally of the Upland variety, but could be greatly improved, and Egyptian could be grown under irrigation. Mexico is the home of the boll weevil, and other insect pests are also plentiful. The crop is largely consumed in the country, but some goes to the United States, especially from Old California. The difficulties in the way of future development are mainly political and economic.

Central America. In Nicaragua and British Honduras cotton has been tried without much permanent success, probably due to excessive rainfall and the competition of rival crops, e.g. in recent years fruit for the U.S.A. market. Colombia and Venezuela have also small crops, probably about 60,000 bales altogether, mostly used in the local mills and for domestic consumption. British, French, and Dutch Guiana (Surinam) were once the source of our best supplies, but have dropped out of cotton growing since the 'sixties. Where the rainfall is not excessive the possibilities of cotton growing should be great, and efforts have again been made recently to revive it.

In the *Argentine Republic* (crop about 140,000 bales) and also in *Uruguay* and *Paraguay*, there is great hope of a considerable development in cotton growing. The area is enormous, the climate is suitable, the rainfall being sufficient, and heavy yields are reported. The quality is very mixed, though American seed is now becoming general. The conditions of cultivation are those familiar in a new cotton-growing country, and require great improvement, e.g. in regard to seed selection and maintenance, and the picking and handling of the crop. Locusts are sometimes very destructive. The chief difficulty is probably the labour supply and the existence of rival crops which require less labour. It may, however, be possible to find other crops of which the harvest requires much labour, but which grow at another season fitting in with cotton, and large developments are looked for.

INDIA

Turning now to the question of new supplies in Grade II we must first consider the possibilities of various established cotton areas. Several countries whose crops

come mainly into Grade III (short staple) have during the present century been developing improved varieties which are of about the same staple as American cotton. The chief of these is India. Cotton growing in India is as old as history, and there is a strong tradition that the quality of cotton grown was in the old days as fine as anything produced elsewhere since. These fine cottons from which the traditional Dacca muslins were made have disappeared or deteriorated, and the bulk of the Indian crop is now below $\frac{7}{8}$ in. in staple. Attempts to improve the staple were made by the East India Company as far back as 1840. One of the survivals of these is the Dharwar American, which has now become the parent of many improved varieties in India. As the result of recent improvements about 2 million bales of the Indian crop are now of about $\frac{7}{8}$ in. in staple or more. The best of these are Punjab American, and some of the superior varieties in Madras, especially Cambodia.

The cotton-growing areas of India are enormous and very widely spread, and the conditions vary greatly in every respect. In the northern half of the Peninsula the season is approximately the same as in America, but in the southern part cotton becomes more and more a winter crop. The chief districts may be outlined as follows—Bombay is divided into (a) Broach, (b) the Oomra Belt, with which may be taken the Central Provinces and Berar, (c) the Kathiawar Peninsula, where Dholleras are the chief variety, (d) Sind and Rajputana, where the shortest variety of Bengal-Sind prevails, as also in most of the Punjab, the United Provinces, and Bihar. In the Punjab, however, certain irrigated districts have now been turned over largely to the production of American types which puts them in a class by themselves. Dharwar in South Bombay is really more akin to Madras, where the best cotton in

TABLE VI
INDIAN CROP, AREA, YIELD, AND PRICE, 1899-1926

Seasons	Area (Acres), ooo's	Crop (Bales of 400 lb.), ooo's	Yield per Acre (lb.)	Net Ex- ports and Consump- tion, ooo's	Season's Average Price	% on Amer.
1899-1900	11,885	2,090	70	2,106	No. 1 Fine Omra 4.40	90
1900-01	14,231	2,953	83	3,133	4.37	85
1901-02	14,506	2,745	75	3,566	4.19	88
1902-03	16,581	3,367	81	4,050	4.47	92
1903-04	18,025	3,161	70	3,789	5.56	80
1904-05	19,918	3,791	76	3,944	4.62	94
1905-06	20,401	3,416	67	4,168	5.00	84
1906-07	22,488	4,934	88	4,855	4.87	76
1907-08	21,630	3,122	58	3,782	5.03	81
1908-09	19,999	3,692	74	4,200	4.94	90
1909-10	20,545	4,719	92	4,928	6.31	80
1910-11	22,596	3,889	69	4,303	7.03	90
1911-12	21,615	3,288	61	3,985	5.63	93
1912-13	22,028	4,610	84	4,483	6.16	91
1913-14	25,023	5,066	81	5,913	5.88	81
1914-15	24,595	5,209	85	4,889	4.46	85
1915-16	17,746	3,738	84	5,109	6.09	81
1916-17	21,745	4,489	83	4,985	10.32	84
1917-18	25,188	4,000	64	4,499	18.78	87
1918-19	20,997	3,972	76	3,991	18.13	92
1919-20	23,352	5,796	99	5,343	19.23	76
1920-21	21,340	3,600	67	4,941	9.20	77
1921-22	18,451	4,485	97	5,972	9.60	85
1922-23	21,804	5,073	93	6,270	11.14	75
1923-24	23,631	5,161	87	5,946	13.35	74
1924-25	26,801	6,088	91	6,923	11.95	87
1925-26	28,491	6,250	88	6,508	8.97	83
1926-27	24,976	4,973	80	—	—	—

India is grown (except Punjab-American). In the eastern portion of the country Assam and Burma also produce a moderate crop, mostly of short-stapled varieties.

In the northern districts cotton mostly requires

irrigation, but in the central and southern portions it is entirely a monsoon crop, which makes the outturn very speculative. The average yield throughout India, as a whole, is very low. As will be seen from the table on page 29 it hardly ever reaches 100 lb. an acre, and is sometimes below 70. This is partly due to the primitive methods of agriculture, which are traditional, but also to the poverty of the soil and the unsatisfactory distribution of the rainfall. But the greatest difficulties in improving the general conditions of cotton production in India lay in changing the traditional organization of the industry. Seed selection was practically non-existent till well into this century, and all efforts at improvement had been by the method of introducing exotic cottons, especially American, which so frequently deteriorated that it was thought degeneration was inevitable. It has now been shown, however, that this was due mainly to mixing, both natural and otherwise. The methods of picking and handling the crop were very unsatisfactory, but the baling (at least for export) was a marked exception. The worst fault probably lay in the marketing system, especially in the failure to pay an adequate price for improved cottons. Attention was concentrated on the ginning outturn and the yield per acre, ignoring staple for which no adequate premium was obtainable. Careless handling of the crop and the introduction of dust, leaf, etc., lowered the grade, and the buyers made no attempt to fight against these conditions. The mixing of staple, both in the fields and in the ginneries, was widespread, and made it exceedingly difficult to maintain improved varieties. In spite of these obstacles, however, the growth of agricultural departments and the introduction of improved methods had led to a general improvement of staple even of the shortest cottons in most districts, and increasing quantities of improved

varieties were being produced in every state, apart from those districts like the Punjab and Madras where large areas were almost entirely devoted to long-staple varieties.

The prospects of further development in India lie largely in the further extension of irrigation, especially in the Punjab and Sind. The Triple Canal System on the "five rivers" of the Punjab has already revolutionized that area, and the Lloyd Barrage on the Indus in Sind, when completed, will also make large areas available for cotton growing. The Indian Central Cotton Committee has done valuable work in co-ordinating efforts towards the improvement of the Indian crop in every direction, while the new East Indian Cotton Association has had a similar effect in standardizing and improving the commercial handling of the crop.

China (crop, say, 2,000,000 bales). The Chinese cotton crop is the third largest in the world, but very little of it is used in England. The bulk of the crop goes into domestic consumption, largely for the wadding of garments. There is also a considerable mill industry (now owning 3,500,000 spindles), and a good deal of cotton goes to Japan.

The area and population of China are, of course, enormous, and cotton growing in recent years has been stimulated by the need of a crop to take the place of the poppy owing to the restriction of the opium trade. The chief districts are in North and Central China. The former includes the valley of the Yellow River and the districts along the Grand Canal southwards. The second is the valley of the Yangtse-Kiang River. There is also a considerable acreage under cotton in the coastal districts round Hangchow and Ningpo. In the south-west (Yunnan) some cotton is grown in the upper basins of the rivers running south into Indo-China.

Cotton is a rain crop, and the climate is, on the whole, suitable, with occasional extremes of heat in summer or rainfall in autumn. The yield is said to be much heavier than in India, and even than in the U.S.A., say 250 lb. of lint per acre, probably due to intensive cultivation. The cotton grown is mostly of the short native types like Indian, including the variety (widely distributed throughout Asia) of which the bolls never open properly, so that they have to be gathered whole and cleaned out afterwards. Since about 1908, however, great efforts have been made to introduce American cotton, and with considerable success in certain districts, but no statistics are available. The whole crop has at times been put as high as five million bales, but two millions is probably nearer the truth. Recent political disturbances have, of course, greatly hindered the development of the crop.

Japan used to grow small quantities of cotton in the south, but since her acquisition of Korea she has concentrated her efforts there. The conditions are very similar to those in China, and the introduction of American types has made good progress. In Indo-China, Siam, etc., there are also a number of districts growing cotton, but the total is not large.

Russia (crop, in 1915, about 1½ million bales). The Russian crop before the war was developing more rapidly than almost any other, and had reached a substantial total, but the provinces in the south-east where cotton is grown are very remote from the rest of the country, upon which they are entirely dependent for food supplies, so that the breakdown of communications and the whole economic system as the result of the war and the revolution almost killed the crop for the time being. The chief districts are (1) Russian Turkestan (Ferghana, Tashkend, Samarkand, and Transcaspia), (2) the native states of Bokhara and Khiva, and (3)

Transcaucasia between the Black Sea and the Caspian. These are the most northerly cotton-growing areas in the world. The climate is almost rainless, so that cotton requires irrigation. In many other respects, also, the conditions are extraordinarily like those of Egypt.

The crop is mostly of the short native variety similar to Indian and Chinese, but great progress had been made in the development of good American cotton. Practically the whole crop was consumed in the Russian mills. The recovery of the crop after the war was very slow, and in 1925 it still amounted only to about 750,000 bales. The prospects of future development are entirely bound up with the political and economic conditions of Russia as a whole.

Persia. Cotton has long been grown in small scattered areas throughout the country, mostly under rainfall conditions, and the quality of the crop is generally of the typical Asiatic varieties. The same applies to Afghanistan.

In *Asia Minor* there are several small areas, of which two were very promising before the war, namely (1) Adana, lying in the Cilician Plain in the north-east corner of the Levant, where the Germans had made great progress in developing a crop both of the characteristic native types and of improved exotic types, mainly American, and (2) Aidin, near Smyrna. There is no doubt that cotton could be grown in many of the valleys throughout the country, and also in Palestine. Small quantities of cotton are also grown in Cyprus, Malta, and Crete, and in small scattered districts throughout the provinces which formerly constituted Turkey in Europe. Even in Greece and the southern parts of Italy and Spain attempts have been made to grow cotton, with some success.

AFRICA

Of new areas where cotton growing on a commercial scale or for export is of recent development, the most promising are in Africa. The area of Africa is about 12 million square miles, mostly within the cotton-growing limits, and pioneer work in the establishment of new cotton fields has been going on since the beginning of this century in almost every part of the Continent.

Cotton growing in British West Africa is linked with the name of the British Cotton Growing Association. Founded in 1901, largely through the instrumentality of Sir Alfred Jones, their first experiments were made in Gambia, Sierra Leone, the Gold Coast, and Lagos (Nigeria), but owing to the climate proving unsuitable, or to competing crops, the last is the only one which has become permanently established on a large scale.

Nigeria contains a total area of 350,000 square miles, with a population of about 20 millions. Climatically it may be divided into three belts: (1) the swampy coastal belt where cultivation of any kind is impossible, (2) the forest belt, where cotton has to compete chiefly with oil palm products requiring less labour, and (3) the Hinterland of Northern Nigeria, where the main hopes of large cotton development lie. The population there, however, is scanty, and much land is required for food crops.

Cotton is entirely rain-grown, though there are possibilities of irrigation round the Lake Chad area. Cotton is indigenous in most of the country, having long been used for native weaving. The total production has been estimated at 100,000 bales, but only part of this is exported. The average yield per acre is only about 80 to 100 lb. per acre, as in India, and the ginning output is only about 27 per cent. The work of the British

Cotton Growing Association was, therefore, directed to improvement of the crop by the introduction of exotic varieties, chiefly American. These give a heavier yield and a higher ginning outturn as well as longer staple, and are much more profitable.

The critical problem in all new African areas is transport. In West Africa the whole system is founded on rivers which are merely supplemented by comparatively short railway lines. Thus the Niger river is 2,600 miles long, of which 1,000 miles are in Nigeria and 400 navigable. Railways run from Lagos to Zaria and Kano and from Port Harcourt across the Benue river to Zaria. Some progress has also been made in providing roads for motor traffic, but infinitely more remains to be done. Beyond railhead or the roads, head carriage by porters is the only available means of transport.

The commercial organization built up by the B.C.G.A. has been beyond praise. They control the supply and free distribution of seed, and the whole of the ginning and baling of the crop is done by them, with the result that the African bale is a model. But their greatest service has been in the establishment and maintenance of fixed prices to the natives. At first they experimented with large plantations under European management with wage-paid native labour, but this was not an economic success, and they have now definitely adopted the policy of encouraging the natives to grow cotton on their own land as independent cultivators. The securing of the price against the world's market fluctuations was practically essential to this system, and has been maintained by the Association sometimes at the risk of huge losses, e.g. in the war slump of 1914 and again in the deflation slump of 1920.

In *Uganda* conditions are very different from those in the West. The B.C.G.A.'s first experiments were in

British East Africa, now Kenya, with white plantations, but these again were not successful. In Uganda cotton growing was first promoted by a missionary society from which sprang the Uganda Company, a commercial undertaking. Other private enterprises developed rapidly before the B.C.G.A. entered the field. The result is that in view of the existence of sufficient competition, it has not been necessary yet to introduce the system of guaranteed prices, though at times the B.C.G.A. have stepped in and bought the crop when, owing to the slump, private enterprise would not do so.

The area of Uganda is about 100,000 square miles, but of this 16,000 is occupied by the Great Lakes, round which most of the cotton is grown, largely for transport reasons. It is said that the existing cotton districts could grow 250,000 bales, which could be increased to a million bales by opening up new districts. Cotton is entirely rain-grown. The population is about 3,000,000, but agriculture on a large scale is greatly hindered by sleeping sickness and the tsetse fly, which prevents the use of cattle for ploughing or transport. The latter is therefore confined to the lakes, rivers, and railways. The main line running from Mombasa to Kisumu on Victoria Nyanza is 1,000 miles long. Lake transport is also considerably interfered with by the growth of sudd (matted reeds) in the inlets and channels. There are a few motor roads, but the great bulk of the cotton crop has still to be brought in by head carriage.

At first the seed supply was chaotic, but since the Government took control only one kind of seed is allowed, originally descended from a long staple American variety which has deteriorated in staple, but is otherwise excellent cotton, and has recently found great favour in Lancashire. The Government also provides buying

centres under Cotton Rules. An interesting feature in Uganda is the presence of a large number of Indians owning ginneries and buying the crop. During the war a great deal was shipped to India, partly because of the lack of shipping facilities elsewhere, but much of it is re-shipped to England and Japan.

In *Tanganyika* (formerly German East Africa) the Germans had been carrying on experimental cotton growing in widely scattered areas from the Lakes to the sea, and under very diverse conditions. The Germans went in for big white plantations, but labour was scarce, and since Great Britain took over the country the B.C.G.A.'s policy of independent native cotton growers has been adopted.

As river transport is inadequate, the Germans had built a railway from Dar-es-Salaam to Lake Tanganyika, and this is now linked up with the great trans-continental system of transport by rail, river, and lake, which has grown from the idea of the Cape to Cairo railway. This system may be outlined as follows—

The Cape to Cairo route runs from Cape Town to Bukama on the Lualaba River (Upper Congo), thence by river to Kabalo, rail to Albertville on Lake Tanganyika, lake steamer to Kigoma (Ujiji) and rail via Tabora on the Dar-es-Salaam line to Mwanza on Victoria Nyanza (which is not yet completed). From Mwanza it continues by lake steamer to Kisumu and Jinja, and rail from Jinja to Namasagali on Lake Kioga. Here there is still a gap to Mongalla on the White Nile, from which steamers go to Kosti, thence rail again to Khartoum and Wady Halfa (with a branch from Atbara to Port Sudan), thence Nile steamer to Assuan and rail to Cairo.

There are also a number of lines, many of them still relatively very short, running inland from the east and

west coasts, but all intended ultimately to link with the north and South routes. These are as follows—

FROM THE EAST COAST

From Mombasa to Kisumu and Jinja (Victoria Nyanza).

From Dar es Salaam via Tabora to Kigoma (Lake Tanganyika).

From Beira to Salisbury and Buluwayo on the Cape to Cairo route, with a branch up the Shiré river to Blantyre and Lake Nyasa.

From Lorenzo Marques to Mafeking on the Cape to Cairo route.

FROM THE WEST COAST

From Luderitz and Walfisch Bay in former German West Africa lines run inland, with a connecting line between linking up with the South African railways.

From Benguella in Angola (Portuguese West Africa), which will ultimately join the Cape to Cairo route near Bukama.

From the mouth of the River Congo short sections of rail make complete rail and river communication to Kabalo on the Cape to Cairo route.

In French West Africa a number of short lines have been built from the coast linking up with the upper waters of the Niger, and the Germans had started a line from the coast at Lome north into Togoland, which now is also French.

Nyasaland. South of Lake Tanganyika lies Lake Nyasa, round which and on the Shiré River are several small but promising cotton-growing areas. The quality of the Nyasaland Upland cotton is good, but the average yield per acre is again poor, being reported as less than 100 lb. There has been a good deal of trouble with cotton pests, but development has probably suffered more from the competition of tobacco. The greatest hindrance, however, to the development of Nyasaland was the long transport by the lake and the Shiré and Zambezi rivers to the sea, the former river being navigable during only a small part of the season. This is gradually being replaced by a railway, but the bridge over the Zambesi railway which will connect with the Beira railway is not yet completed.

Rhodesia, both North and South, offers great hopes for cotton growing, and has the advantage of direct railway communication to the sea.

In the *Union of South Africa* cotton growing has been developing rapidly in three main areas, namely, the Transvaal, Swaziland, and Natal and Zululand. The area of the country is enormous, but owing to differences of climate and soil, cotton-growing areas have to be selected with care and knowledge, and in many parts the rainfall is insufficient or unreliable. There were also difficulties with regard to labour in certain districts, and apparently the system of independent native cultivators has not found favour throughout South Africa. Since the war, however, great strides have been made, and the necessary organization for ginning, handling, and merchenting the crop has been built up very rapidly in recent years.

There are also many small but promising cotton crops in the various non-British areas of Africa. Working round the coast in geographical order these may be tabulated as shown on p. 40.

Mesopotamia. To complete the list of the new cotton-growing fields in the British Empire, two interesting post-war developments must be noted. In Mesopotamia, now officially called Iraq, cotton of the usual Asiatic short staple varieties is indigenous, but since the war considerable progress has been made with exotic cottons, mainly American, and an excellent variety, known as Meso White, a good staple Upland cotton, has been developed out of "Webber" American staple Upland. Cotton is grown under irrigation, but the conditions are unlike those of Egypt, because the floods come earlier, and are frequently excessive, requiring elaborate provision of escapes. The climate is hotter in summer and colder in winter than in Egypt. The maximum probable

District	Nationality	Approximate Crop (500 lb. bales)
<i>East Coast—</i>		
Eritrea	Italian	3,000
Jibuti	French	2
Somalia	Italian	2,200
Mozambique	Portuguese	2,500
Madagascar	French	2
Reunion	French	2
<i>West Coast—</i>		
Angola	Portuguese	1,500
Congo	Belgian	18,000
French Equatorial Cameroons ¹	French	1,400
Sudan	French	1,800
Dahomey	French	5,000
Togoland ¹	French	2,000
Ivory Coast	French	7,500
Upper Volta	French	1,300
Guinea	French	11,000
Senegal	French	8,800
<i>Mediterranean—</i>		
Morocco	French	900
Algeria	French	11,000
Tunis	French	2
Tripoli	Italian	2

¹ Formerly German.² Under 100 bales.

area is about three million acres, of which only one-third would grow cotton in each year. At present, however, only about one-sixth of this is irrigable. The Government inaugurated a model plantation and seed farm, and the British Cotton Growing Association erected a ginnery in 1920. Large developments with European capital were proposed, but these had not matured in 1926.

Australia. Cotton was grown in Queensland from the

'sixties, and spasmodically since, but a large new development has taken place since the war, and also on the Murray River in New South Wales. The labour difficulty and the white-Australia policy are likely to be the limiting factors. Recent developments have been on the lines of small plots of cotton on farms owned and cultivated by white men. In Queensland an acute controversy has raged over allowing ratooned cotton, which was at first prohibited by legislation, but this was repealed in 1925

FINE COTTON

So far we have been dealing with cottons more or less of American quality and staple. With regard to the finer cottons of longer staple, the finest and longest of all is the small Sea Island crop of the West Indies, now practically the sole source of the world's supply of this class of cotton, which before the advent of the weevil to the Atlantic States amounted to about 100,000 bales. Cotton growing was re-introduced into the West Indies about 1902 by the B.C.G.A., after the failure of the sugar crop owing to the competition of German beet. The original Sea Island seed was brought back from the Carolinas, and some of the islands, especially St. Vincent, St. Kitts Nevis, and Montserrat, have produced cotton equal to the best "islands." The crop, however, again suffered severely from the competition of sugar during the war and post-war period, and the total crop in recent years has probably been only about 4,000 bales, as against the pre-war figure of about 7,500 bales.

Egypt. For the bulk of its supply of fine cotton, therefore, the world has now to look to Egypt and the Sudan. The Egyptian cotton of to-day is quite modern, dating only from about 1820, when a Frenchman named Jumel found a cotton plant growing in the Cairo

garden of one Maho Bey, who had been an official in the newly conquered Sudan. Jumel brought it before Mohammed Aly, and this native perennial type was crossed with Sea Island, Brazilian, etc., and soon developed into the characteristic annual type of modern Egyptian cotton. With a view to its general introduction the whole irrigation system of the country had to be transformed from "basin" irrigation to "perennial."

The total cultivable area of Egypt is only about six million feddans (acres), comprising the Delta (roughly $120 \times 120 \times 70$ miles) and a narrow strip of about 550 miles long by 1 to 10 miles wide from Assuan to Cairo. The rainfall diminishes from about 8 in. per annum at Alexandria to 1 in. at Cairo and none at all in Upper Egypt. Everything, therefore, depends on irrigation, and to understand the position to-day, especially in regard to the Sudan, it is necessary to trace the history of the system since 1820. Under the "basin" system the whole country was divided into large blocks of about 40,000 acres, surrounded by embankments, and at flood time water was let into these from the Nile, lying on the ground till the flood went down. Under this system summer crops were impossible except where primitive methods of irrigation were available. Even if cotton could be grown it would have been submerged by the flood before harvest. Under the new system of perennial irrigation, water was carried all over the Delta by canals leading from the two main branches of the river which enter the Mediterranean at Rosetta and Damietta respectively. These canals, however, became choked with silt during the flood, and their annual clearance involved an oppressive use of forced labour. To remedy this the Delta Barrage was conceived in 1833, which by maintaining an artificial head of water at the bifurcation of the river would provide more water in the

canals and for a longer period, and also a higher level of water, allowing "free flow" irrigation and a reduction of the forced labour for clearance. The Barrage was finished in 1861 at a cost of about £4,000,000, but almost immediately part of it collapsed, and it was abandoned in 1867. After the British Occupation in 1882 it was repaired and fulfilled its purpose for the first time. Thus the full supply of the Nile was utilized, but more was still needed. The Assuan Dam was a great storage reservoir, not a mere barrage or regulator, and the complete system converted the river from Assuan to the sea into a great series of locks 600 miles long. The dam is filled at the tail end of the flood in early autumn, and when the river begins to fall to summer level about April, the Cairo barrage is closed and the sluices of Assuan Dam are opened gradually, thus maintaining a steady supply throughout the system till the flood comes again. Under the system of summer "rotations" the irrigation canals are divided into three sections, each of which receives water for only six days out of 18, 21, or 24 days, according to the supply. The demand depends on the period over which this supply must be spread out, which in turn depends on the date and height of the previous flood, and the date when the next flood is expected, the latter being known from reports of the rainfall at the sources of the Nile and of the rise of the flood, which takes about six weeks to reach Cairo.

After the completion of Assuan Dam in 1902 the water supply became easier every year, but already there were indications that the average yield of the crop was falling, and in 1909 this came to a head when, owing to a peculiar combination of circumstances, an excessive irrigation supply produced serious water logging in the lower parts of the Delta. After a long controversy a

great scheme was inaugurated by Lord Kitchener which involved the restoration of the damaged areas in the middle zone of the Delta by the provision of improved drainage, and at the same time the reclamation of the northern zone, i.e. the salt water lakes along the Mediterranean coast, the value of which would cover the whole cost of the scheme. To provide further water for these schemes the Assuan Dam was raised to a higher level, which more than doubled its original capacity. An acute controversy broke out about the methods of the proposed drainage scheme, and a record low flood in 1913 raised the question whether even the increased storage supply at Assuan would provide sufficient water for the reclamation of the new areas. Two further schemes were, therefore, proposed, viz., a dam on the Blue Nile at Makwar to irrigate the Gezira area between the Blue and White Niles, and a dam on the White Nile at Gebel Auli, a second Assuan, for Egypt's benefit. This had the additional advantage that it would hold back the White Nile flood till the earlier Blue Nile flood had passed, thus prolonging the length of the flood period, reducing the danger of a very high flood, and saving loss through evaporation in the Sudd regions of the southern Sudan.

Work on all these schemes had been begun before 1914, but was practically stopped by the war, and after 1918 they were not fully taken up again. In the meantime further controversy had broken out about the Sudan schemes on the ground that the Blue Nile Dam was taking, for the benefit of the Sudan, water which was required in Egypt; hence the original limitation of the Gezira area to 300,000 feddans, now cancelled. There is a modicum of truth in this argument, which, however, could easily be met by a further storage scheme at Lake Tsana in Abyssinia, and, looking still further ahead, by

storage schemes in the Great Lakes at the sources of the White Nile. The Makwar Dam was completed in 1925, but the White Nile Dam is still unfinished.

Let us return to the history of the Egyptian crop since 1909. The years 1910 to 1913 gave better crops, the conditions of 1909 not being repeated, and the average yield increased again till 1914. Then, however, a new fall began, due to the pink boll-worm which proved much more difficult to control than the pests previously known, namely, cotton worm and the ordinary boll-worm.

With regard to the quality of Egyptian cotton, even its comparatively brief history shows a long succession of important varieties, all in turn deteriorating, e.g. Gallini, Abyad, etc., in the nineteenth century, and Afifi in recent times, followed by Jannovitch, Nubari, and Abbassi, and finally Sakel. Since about 1912 the latter had become practically the sole variety in the Delta, while Upper Egypt was devoted entirely to Ashmouni. In 1924, however, owing to the very low premiums of Egyptian generally, and especially Sakel, Upper Egyptian types invaded the Delta with results which may prove serious to the superior variety. The table on page 46 gives in condensed form the history of the Egyptian crop since 1899, i.e. before the opening of the Assuan Dam. The growth of the area will be noted, and also the fact that the crop has not increased in proportion as shown by the falling yield first to 1909 and then again from 1913. The table also gives the seasons' average prices of Egyptian, from which it will be seen that there have been, especially since 1909, extraordinary fluctuations in the premium of Egyptian over American, e.g. in 1909-10 due to the crop failure of that season, and in 1919-20 due mainly to the tyre boom in America. In 1923, on the other hand, the premium fell to practically nothing, and the natural result was a reaction in 1924-25

to very high premiums again, which, however, lasted only a season, to be followed once more by a rapid swing of the pendulum again, and in 1926 premiums were once more in the neighbourhood of 100 per cent.

TABLE VII
EGYPTIAN CROP, AREA, YIELD, AND PRICE, 1899-1926

Season	Area, Feddans	Crop, Kantars	Average Yield per Feddan	SEASON'S AVERAGE PRICES	
				F. G. F. Brown	Premium Over American Middling
	ooo's	ooo's	lb.	Pence per lb.	Per Cent
1899-1900	1,153	6,510	5.64	6.81	40
1900-01	1,230	5,435	4.42	6.87	33
1901-02	1,250	6,370	5.10	6.31	31
1902-03	1,276	5,839	4.58	8.44	55
1903-04	1,333	6,509	4.88	8.56	23
1904-05	1,437	6,313	4.39	7.37	52
1905-06	1,567	5,960	3.80	9.25	55
1906-07	1,506	6,949	4.61	10.37	63
1907-08	1,603	7,235	4.51	8.81	43
1908-09	1,640	6,751	4.12	8.44	53
1909-10	1,597	5,001	3.13	13.12	67
1910-11	1,643	7,574	4.57	10.75	35
1911-12	1,711	7,424	4.34	9.56	57
1912-13	1,722	7,533	4.37	9.79	46
1913-14	1,723	7,684	4.46	9.45	30
1914-15	1,755	6,490	3.70	7.34	40
1915-16	1,186	4,806	4.06	10.42	39
1916-17	1,656	5,111	3.10	21.56	75
				<i>Sakel</i>	
1917-18	1,677	6,308	3.75	30.97	43
1918-19	1,316	4,821	3.66	27.85	41
1919-20	1,574	5,572	3.54	60.34	139
1920-21	1,828	6,030	3.30	30.24	154
1921-22	1,292	4,858	3.76	19.75	74
1922-23	1,801	6,213	3.45	17.29	16
1923-24	1,715	6,531	3.81	21.55	22
1924-25	1,788	7,274	4.07	29.82	116
1925-26	1,924	7,965	4.14	20.05	86
1926-27	1,786	8,000	4.50	—	—

Estimates in heavy type

The Sudan. There are several widely separated cotton-growing areas in the Sudan. Tokar lies near the Red Sea in the Delta of the river Baraka, 90 miles south of Port Sudan. Development has been greatly hindered by difficulties in controlling the flood, but those have now been partly mitigated. Mostly Sakel is now grown, and the yield per acre has improved. There is an extremely efficient system of government control both of the seed supply and in maintaining the purity of the crop in the fields, and ensuring clean picking. The crop is classified by the Government for sale. Transport has been greatly improved by a new railway to Port Sudan.

Kassala lies on the River Gash in the hills close to the Abyssinian border, and has now been connected to the Port Sudan-Atbara railway; this should lead to large developments, say 100,000 bales in course of time. The crop is mainly Sakel, and of high quality. In the *Nile Valley* there are several scattered areas, e.g. at Zeidab and Atbara and near Khartoum. Here improved varieties of American cotton have been found peculiarly suitable.

The Gezira, lying between the Blue and White Niles south of Khartoum, contains a total area of about four million acres. The completion of the Makwar Dam and canal system has brought 100,000 acres annually under cotton, and as the labour supply increases this may be largely extended. The whole district is organized by the Sudan Plantations Syndicate on the system of sharing the crop between the Government, the Syndicate, and the native growers. The crop is carefully controlled, and is ginned and sold by the Syndicate. Excellent Sakel is being produced, and a rapid increase was expected from 1926 onwards.

Finally, in the rain-grown areas of the south there are

great possibilities of further development, especially for American types of cotton, and the area available is almost unlimited.

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References

The World's Cotton Crops (Todd), A. & C. Black.

Cotton and the Cotton Market (Hubbard), Appleton.

Cotton Growing Countries, Present and Potential. International Institute of Agriculture, Rome, 1926.

Empire Cotton Growing Review (Quarterly).

Reports of the British Cotton Growing Association.

CHAPTER II

THE LIVERPOOL COTTON MARKET

I. THE SPOT MARKET

THE process of marketing cotton begins with the ginning or separating of the lint from the seed. This is actually the first of the many manufacturing processes to which cotton is subjected, and is invariably done in the district where the cotton is grown, the cost of carriage of seed cotton being too great to allow of its transport to a distant ginnery. The lint accounts for only about one-third of the weight of the seed cotton, so that the farmer's wagon of 1,500 lb. of seed cotton yields just a bale of lint of the average weight of about 500 lb. gross, or 478 lb. net.

From the fields, generally after a few days' storage, the cotton is carted to the ginnery, where the lint is baled and pressed to a density of about 15 lb. to the cubic foot. The size of a bale when it leaves the gin is $27 \times 54 \times 46$ in.

The small farmer then carts his bale to the nearest town and sells it to a dealer, who inspects a sample obtained by cutting open the canvas on both sides. The price will depend not only on the grade of the cotton, but also on its staple, that is the length of the individual fibres, varying from Sea Island, 2 to $2\frac{1}{2}$ in., to the Upland varieties, often less than 1 in. The term "staple" also includes such qualities as strength of fibre, roughness (caused by convolutions or twists in the hollow ribbon-like cotton hair), and evenness in length.

The dealer or factor in the small interior town accumulates bales in his warehouse or in the railway yard (or, when that overflows, in the street) until he can sell to a merchant. Over the greater part of the cotton belt the dealer draws a sample from each bale, and arranges these samples on a table in his saleroom for the merchants' inspection, but in Georgia, North and South Carolina, and parts of Alabama the cotton is "taken up" in the open air. A merchant in Savannah, for instance, may buy a hundred bales of cotton from a dealer in a small town in Central Georgia. The price is arranged and the purchase made by telephone. The price is settled as the price of a certain definite grade or quality, and differences in price up or down for better or worse qualities are agreed upon at the time of purchase. The merchant then sends his representative with two or three negro assistants and his own scales to "take up" the cotton, which is usually lying in a railway yard, the bales on end in a long row. The first bale is moved slightly back, the canvas cut open, and a sample weighing about half a pound taken out; buyer and seller examine the sample on the spot, haggle over its quality for a while, finally decide what grade to call it, and the bale is then branded in ink with a stencil, and weighed. The party then moves on to the next bale and the process is repeated.

A good deal of progress has been made since 1920 with the co-operative marketing of cotton, especially since the establishment of the American Cotton Growers' Exchange as the central organization of the various state co-operative associations. The method adopted is that the farmer receives an immediate payment on delivering his cotton to the Co-operative Association of 50 to 60 per cent of its value, intermediate payments as sales are made, and a final distribution when all

the cotton is sold. The system has many advantages ; it ensures the farmer getting the market value for his cotton, for he was often cheated by unscrupulous dealers. It provides good warehouses, whereas the small farmer often left his bales uncovered in the open for months ; and it is possible that it cuts out some middlemen's profits. One of the difficulties that it encounters is that cotton is frequently pledged to a local bank before it is grown against advances for seed, fertilizers, etc. The farmer who joins one of these Associations must bind himself legally for four or five years not to sell except through the Association ; this bond has been tested in the courts and pronounced valid. Perhaps the greatest advantage of the scheme is that it ensures that the crop shall be marketed gradually through the year ; instead of all being offered at once in the autumn.

Before shipment the bales are compressed by extremely powerful steam presses at the ports or the large interior towns to a density of 30 to 34 lb. per cubic foot. This ✓ reduces the depth of the bale from nearly 4 ft. to a little over 2 ft., and a considerable saving in freight and storage costs is thus effected.

When the bales are discharged from the steamer in Liverpool they are handled by a master porter, whose duty it is to have them sorted into lots corresponding to the marks on the bills of lading, to weigh them, and deliver them to the owner.

It frequently happens that the marks on one or two bales have become illegible. These are left until the rest of the cargo has been cleared from the quay and then allotted as " no marks " to the merchants to whom bales are still due. If a merchant is dissatisfied with the quality or weight of the " no marks," he may claim on the shipping company for his missing bales, but this is

an unusual procedure, and on the whole little injustice is done.

On arrival in warehouse the bales are weighed, the canvas cut open after breaking off two of the bands, and a sample drawn out. It is impossible to draw a reasonable sample without taking off one or two bands, and the result of this and of carelessness at the compresses is that the American bale has an evil reputation as an ugly, untidy, bedraggled package. Attempts have been made to find a remedy, notably the introduction of "round" or Lowry bales and, more recently, the Munger pressed bale. Neither makes much progress, probably on account of the scarcely veiled opposition of vested interests, but in 1925 the U.S. Department of Agriculture was conducting an investigation into the question of baling, and possibly some good result will follow.

As the sample is drawn a tag printed with a distinctive number is attached to each bale. This tag has a perforated end bearing the same number; the end is torn off and inserted in the sample. The samples are sent to the dressing room, where the ragged edges are pulled off and the samples arranged in sheets of brown paper, sixteen to a sheet. The sheets are rolled up, marked with the distinctive lettering branded on the bales, and sent to the saleroom for selection.

Selection is the process of arranging the bales in "even-running" lots, that is lots in which each bale is, within narrow limits, of the same grade and staple as its neighbours. A mixed lot is (from the spinning point of view) only worth the value of the lowest bales it contains. The cotton merchant is not a mere profit-snatching middleman; he performs real services to the community by financing the cotton in transit and by keeping a stock in warehouse from which Lancashire

can take its choice, but perhaps his greatest service is in selecting his stock into even-running lots, so that each bale will produce the same quality of yarn as the other bales of the same lot

The Liverpool grades for American cotton which were in use until 1924 were " Middling Fair," " Barely Middling Fair," " Fully Good Middling," " Good Middling," " Fully Middling," " Middling," " Fully Low Middling," " Low Middling," " Fully Good Ordinary," " Fully Ordinary," and " Ordinary." The official standards for these grades consisted of shallow wooden boxes about 2 ft. square, each containing twelve samples not all exactly alike, but differing slightly within the limits of the grade they represented. The best sample in the " Middling " box, for instance, was almost as good as the worst bale in the " Fully Middling " box, so that, in theory at any rate, the whole crop was represented. These standards had been in use for some fifty years, with only trifling alterations, and they were the basis of the standards used in all the Continental Exchanges. They were superseded in 1925 by the Universal Standards laid down by law in the United States, and made up by the Department of Agriculture in Washington. These standards are " Middling Fair," " Strict Good Middling," " Good Middling," " Strict Middling," " Middling," " Strict Low Middling," and so on, the word " Strict " replacing the Liverpool word " Fully." Universal " Middling " is about equal to the old Liverpool " Fully Middling," and there is a rough correspondence between the grades above. Below Liverpool " Middling," the relations between the old and the new are not easy to define, as the Universal standards contain more reddish spotted samples, but in a normal year Universal " Low Middling " differs little in value from the old Liverpool " Low Middling."

The change was almost forced on the Liverpool Cotton Association by the passage in March, 1923, of the United States Cotton Standards Act, which imposed heavy penalties (up to six months' imprisonment) on any American citizen "buying, selling, offering, quoting, or receiving quotations based on any standards other than those of the United States." It also prescribed that the final right of appeal on disputes regarding quality should be to the Department of Agriculture at Washington, notwithstanding any clause in the contract providing for arbitration and final appeal in Liverpool. After prolonged negotiations the Liverpool Cotton Association agreed to adopt the United States Standards as Universal Standards, the difficulty of the final appeal to the Department of Agriculture being got over by the Secretary of Agriculture consenting to appoint the Liverpool Appeal Committee as a "Board of Appeal" under the Act. In 1925, after further negotiations, the Liverpool Cotton Association signed a Supplemental Agreement safeguarding Liverpool's right of representation when the standards are reviewed.

One reason for the disparity of view between Liverpool and the United States is that they think in terms of grades, while Liverpool thinks in terms of value. If a set of samples is submitted to the Department of Agriculture for the purpose of settling a dispute they record a decision, giving the grade of each bale. Under similar circumstances the Liverpool Appeal Committee records a decision, giving the number of points (a point is $\frac{1}{16}$ of a penny) per pound better or worse than the grade specified in the contract.

The selection of cotton is an art which takes many years to acquire; a good north or east light is essential, and sudden changes of light such as occur on a showery day in April will bring a good selector to the verge of tears.

The process consists in comparing, mentally or actually, the sample in hand with one of the standards or with a known type sample. The quality of the staple is decided by pulling apart a portion of the sample until a small tuft of parallel fibres remains between the finger and thumb. The resistance to the first pull, especially in the shorter styles of cotton, generally gives the experienced selector all the information he requires, not only as to length but also as to strength, fineness, roughness, and evenness. When the samples have been arranged in lots the perforated tag ends are removed and the numbers listed and sent to the warehouse, where the bales are lotted according to the corresponding numbers on the tags.

The cotton is now ready for sale ; the buying brokers make known their requirements every morning, and samples of suitable lots are sent to their buying rooms together with a list of the prices asked. These prices are not, as a rule, expressed in pence per pound, but in so many " points on " or " off " (i.e. added to or deducted from) the price of " futures " for certain months delivery. The reason for this is that when the actual cotton was purchased it was " hedged " by a sale of " futures."

The spinner who buys cotton " on call," i.e. at say 140 points on March, is at liberty to fix the price at any time he pleases during business hours up to a certain date. The futures quotation for March delivery at the time the spinner decides to fix the price is noted, the 140 points added to that quotation, and the total becomes the price at which the cotton is sold.

The two most usual forms of contract in Liverpool are the " Liverpool Spot Terms " contract and the C.I.F. contract. The former is mainly used by spinners buying through a Liverpool broker. It stipulates that the cotton shall be delivered from a Liverpool warehouse,

that it shall be equal to a sample shown at time of sale and retained by the broker ; and bales not equal to the sample shall be exchanged once or a fresh tender made ; if the second tender or the exchanged bales be still not equal to sample the buyer may invoice the cotton back to the seller at a price to be decided by arbitration ; the allowance for tare is 4 per cent for canvas plus the actual weight of the bands ; the date or dates of delivery are stipulated on the contract ; and payment is due ten days after delivery.

The C.I.F. contract is mainly used by merchants buying from American shippers. It differs from the Liverpool Terms contract in that the cotton becomes the property of the buyer as soon as it is shipped ; the price covers the "cost," "insurance," and "freight," and the buyer takes delivery of the cotton on the quay ; any bales which are not equal to the sample or the standard contracted for are not exchanged but must be accepted at an allowance to be decided by arbitration if necessary ; there are minor differences in the tare allowances ; payment is usually made by cash in exchange for shipping documents (i.e. bill of lading and insurance certificate—the bill of lading is the authorization of the shipping company to deliver the cotton to the buyer) or by a draft or bill of exchange.

The buying broker through whom a spinner has bought cotton on a Liverpool Terms contract, when the time for delivery comes, sends two men to the warehouse to sample the cotton. A sample is drawn from each bale, the bale is tagged, and the perforated end put in the sample. These samples are taken to the buying room and carefully compared with the "buying sample," which the broker retained at the time of purchase. Any which are not equal to the buying sample are put on one side and shown to the selling merchant. After

discussion agreement is reached as to which of the redrawn samples really are not equal to the buying sample, the numbers are recorded and fresh bales are tendered in exchange. When delivery is required, the buying broker sends his men to the warehouse with a list of the numbers which they are to take (or, alternatively, with a list of the "back numbers," i.e. the numbers they are not to take). Each bale is weighed at the warehouse door, and the weights noted by buyer and seller. An invoice is rendered to the buying broker, who adds his commission and forwarding charges to it and sends it to the spinner.

If when the bales are opened at the mill it is found that part of the bale is equal to sample and part is distinctly inferior through carelessness or dishonesty at the gin where the bale was made, or if it contains damaged, caked, or mildewed cotton or foreign matter such as lumps of wood and iron, the spinner may return the bale, or the inferior portion, or the foreign body, and the merchant must pay him the value of an equal weight of the cotton he bought. If the canvas on the bales exceeds by an average of half a pound per bale or more the allowance for tare stipulated in the contract, the merchant must pay the value of sound cotton for the excess, if the claim is properly substantiated.

The period within which all such claims must be rendered is three months and ten days after delivery, and at the expiry of that period the transaction is closed.

On page 89 will be found a brief account of the various classes of dealers in cotton who constitute the personnel of the Liverpool Cotton Market, in regard to both spot and futures; but it will be more appropriate to insert here a description of how the spot business is actually conducted in Liverpool.

Every morning a list is put up on a huge blackboard

in the vestibule of the Cotton Exchange of the requirements of the various buying brokers and their clients. The salesmen or representatives of the merchants or selling brokers, noting these, at once go to their own salerooms, collect samples of anything they think likely to suit these requirements, and proceed to the buying broker's office in the hope of submitting them to the spinner with the prices asked. They may be met with the reply that the broker is only "looking through," which in effect means that he is merely testing the market in view of probable visits from his spinner clients in the immediate future. Or, again, the buying broker may want samples for what is known as "averaging." He goes through the full "sample paper," which contains samples of 16 different bales out of a lot of, say, 50 or 100, and takes out a little of each one to represent the average quality of the lot. This sample in miniature is wrapped up in a small roll and marked with the name of the selling broker and other particulars; and armed with a number of these the broker goes to Manchester on the following Tuesday or Friday, in the hope of submitting them to his spinner clients on 'Change there. The spinner may make a bid for one of them, either then or later, but will more probably delay his decision till perhaps the following day when he goes down to Liverpool and goes through the full samples in the broker's office. If the spinner is inclined to favour a particular sample he will, perhaps after a good deal of haggling, make a bid of considerably less than the price asked. The salesman reports this bid to his employer, who may have to refer it to his principals, the owners of the cotton, and after prolonged negotiation, involving much running back and forward and comparison of samples by the buying broker, the successful salesman at last closes the deal. Prices are almost invariably fixed at

so many points on or off the current quotation of near futures, i.e. of the current month or sometimes of the nearest "active" month (see page 78).

Spot sales, however, in the sense in which the phrase is understood by the layman, are not always for immediate delivery; what are called "sales on spot terms" may be spread over a period of some months ahead, and in that case each delivery will be at so many points on the price of futures for that particular month, but this requires further explanation in the following section dealing with futures (see page 75).

II. THE FUTURES MARKET

In order to understand the meaning and functions of a futures market it is necessary to recall what a market is. The popular idea of a market is simply a place, either in the open air or under cover, where sellers and buyers of a particular commodity, or of many commodities, congregate periodically to dispose of their wares or to satisfy their requirements. But a market in the economic sense is something wider; it means the aggregate of all the producers and consumers within a certain area, large or small, whose supply and demand are the opposing forces which fix the price of the commodity. The essence of a market is that as the result of free communication every seller and every buyer knows where the best price is obtainable, and is in a position to do his selling or his buying there. The effect is that prices will be uniform throughout the whole area of the market, because if in one section prices have temporarily fallen lower than elsewhere buyers will flock to that section while sellers will avoid it. The fundamental necessity of a market is universal knowledge of the prices ruling, and the ability of both sellers and buyers to move freely within the area.

The extent of a market may vary greatly in point of either space or time. In order that the area of a market may be very wide, e.g. the world's market for food stuffs, metals, or textiles, the commodity must be in universal demand. It must be portable, possessing considerable value in proportion to its weight or bulk, and also durable, i.e. neither fragile nor perishable, so that transport over long distances is possible at moderate cost. But most of all, it must be easily described, sampled, or graded, so that it can be bought without actually seeing the goods.

Again, in point of time, the market for a perishable commodity may be confined to daily supplies and consumption, or, in the case of a commodity which will "keep" indefinitely, it may go on continuously from year to year, supplies being carried over from one season's production to another. Obviously the duration of a market depends on whether the supplies are periodical, as in the case of annual crops, or whether the supply is limited only by the willingness of manufacturers to extend their factories; and again on whether the demand is seasonal, or merely a passing fashion, or whether it is permanent and only limited by the price at which the goods are offered.

It will be seen that in all these respects cotton is most favourably situated, and as a result the world's cotton markets are perhaps the most completely developed and the most perfectly organized of almost any commodity. This is specially true of the market for the raw material, and the best evidence of this is the fact that cotton prices in the principal markets of New Orleans, New York, Liverpool, Alexandria, and Bombay are synchronized and standardized to a really wonderful degree.

The foundation of the whole system is the possibility of sale by sample or description. The modern system

of description by grades dates back only to the early years of the nineteenth century, when the American crop began to play an important part in the world's production. Before that our supplies came chiefly from South America, the West Indies, and the Levant, and they were usually described simply by the name of the country of origin, e.g. Grenada, St. Domingo, Barbados, etc. The system of grading was, however, in use for sugar and coffee, and a similar system was apparently in use for Sea Island cotton in 1805. It is interesting to note that the term " Middling " was in use for both sugar and coffee before it was applied to cotton. The same decade also saw the introduction of actual sale of cotton by sample exhibited in the selling broker's office. Previous to that, in connection with the auction sales which were a recognized method of disposing of cotton, samples were sometimes laid out in the auctioneer's saleroom, but this apparently did not obviate reference to the actual bales in warehouse. The reason was that the numerous cottons on which we then relied were so varied in quality and condition that it was impossible to judge their value without seeing the goods in bulk. But the appearance from about 1800 onwards of really large supplies of American cotton, all from practically one source—the Atlantic States—and all uniformly handled by the new saw-gin, made it possible for the sellers to select or sort out the cotton into even running lots, all of about the same grade ; and in those days the staple varied very little. Thus it became possible for would-be buyers to judge considerable quantities of cotton by sample, without referring, in the first place, at least, to the actual bales ; and somewhere about 1810 Mr. Robert Gill introduced the custom of offering cotton for sale by sample in his office. At a later stage the custom apparently changed, and the sellers had to take

their samples to the buying broker's office ; and that custom in spite of protests (recorded in 1845) has obtained ever since.

The next stage in the development of the market is difficult to trace clearly. Sale by sample on this side had apparently been followed by the custom of sending samples from America to Liverpool, but there was little to be gained by this as long as both the samples and the actual bales had to come by sailing ship. But with the advent of steamships and regular services (the Cunard Line was established in 1840), it became possible to send samples much faster than the bulk, and the practice developed in Liverpool of selling cotton "to arrive." This was not, however, in any sense a system of "futures" as we know it to-day. It was simply a sale of actual cotton of a specific quality for deferred delivery.

Long before this, however, it had apparently become customary to make what were already known as "speculative" purchases of cotton ; but these again were purchases of actual cotton, the only difference being that the buyer did not mean to resell or to consume the cotton immediately, but to hold it for a longer or shorter time. As far back as 1811 there are references to this, and in 1832, when the first "General Circular" appeared, it contained statistics of imports, sales, stocks, and current prices of cotton, and the sales were classified as "Bought on Speculation," "Purchased for Exportation," and "Taken for Consumption." As a matter of fact this distinction of sales for speculation was retained in the Association's circulars right up till 1917.

By the time the regular circulars began, if not indeed much earlier, the system of grading was definitely established, and it is interesting to note that the Circulars used only one uniform system of grading for all kinds

of cotton, prices being quoted for "Ordinary to Middling," "Fair to Good Fair," and "Good to Fine."

The interruption of supplies during the American Civil War (1862-65) naturally produced very feverish times in the cotton trade, and apparently the amount and the intensity of speculation were causing much perturbation in the trade. The end of the war happened to coincide with the laying of the Atlantic cable, and the new acceleration of communications produced a real revolution in the methods of the raw cotton trade. The new method is attributed to Mr. John Rew, of Liverpool, about 1870; and the essential change was that instead of buying and selling by sample a specific quality or grade of actual cotton "to arrive," his contracts were for the delivery of cotton of any grade within certain limits, which at first were quite narrow, the consideration being determined on a basis price for middling with differences for grades above or below the "basis." This is the first introduction of the idea of a basis price; and the importance of it was that it enabled the Liverpool importer to buy in America by cable and sell *immediately* in Liverpool without knowing exactly what he had bought. When the cotton arrived in Liverpool its actual grade was settled with the purchaser, and the difference in value above or below middling determined according to the state of the market at the time.

This, then, was the first "Futures" contract in anything like the modern sense of the word, and as the actual date of arrival of the cotton was uncertain, for most of it still came by sailing ship, a margin of two months was allowed in the date of delivery—this being the origin of the "double month," e.g. January-February, meaning that the buyer could be called on to accept the cotton any time from 1st January, but the seller had up till 25th February to deliver. This system of double

months continued until 1918. In other respects, also, the customary details of the contract have been modified, e.g. the range of grades deliverable is now defined as "Not lower than low middling (equal in colour to the standard and of not less than fair staple)." The introduction of the standards or "boxes" representing the different grades dates back to the early days of the Cotton Brokers' Association.

Another interesting development was the now almost invariable custom of expressing the value of the different grades or staples of American in points on or off the basis price of middling. This seems to have come into vogue a little before 1902, when the system of quoting prices in 32nds and 64ths of a penny gave way to the use of decimals or hundredths of a penny, but its general adoption was greatly facilitated by the introduction of the decimal system. It is interesting to note here how by the gradual adoption of a shorthand method of speech "basis" in the customary parlance of the market has come to mean the points on or off the basis, i.e. the differences above or below the price of middling instead of that of middling itself—a practice which is very confusing for outsiders. The word "basis" is also used in one particular sense as meaning the points on which the spot price of each grade normally commands over the corresponding price for near futures.¹ In order to avoid the confusion which this double use of the word "basis" inevitably produces in the mind of the layman, the writer will in future use the phrase "basis middling" when the real basis or standard price is meant, and the words "points on," etc., for the differences above or below middling.

It cannot, however, be too strongly emphasized that this so-called futures contract, now known officially

¹ See page 83.

as the ring contract, is fundamentally the same as all the other contracts in use in the Liverpool market. It is a contract for the delivery of actual cotton just as much as a spot terms contract, the only difference being that instead of specifying one particular grade of cotton it allows a certain choice or elasticity in the exact grade or quality that may be tendered against the contract. The essential advantage of the new form lay in the point that this elasticity made it possible to buy and sell cotton by description alone without seeing the actual cotton at all, or even a sample of it, so that business could be done by telegram and, therefore, almost simultaneously both in America and in Liverpool. The value of this facility lay in the fact that it practically eliminated the risk of fluctuations in value during the period that formerly elapsed between purchase and sale, and so important was this that very soon the volume of futures sales practically dominated the whole market, and became the chief factor in fixing the basis price of middling cotton, and therefore by relation the prices of all other grades.

But the new form of contract soon began to develop other uses. It was obviously a much more convenient channel for speculative purchases than any of the contracts previously used, partly because it could be obtained for months a considerable way ahead, which gave the purchaser so much longer to pay, and also because it could be more easily disposed of or passed on than a contract for specific cotton. The rapid development of this business soon involved other consequences. The fact that such contracts might pass from hand to hand many times before the date of delivery led to complications in the actual completion of the contract, which finally became so difficult that the setting up of a Clearing House became obviously the next step

This was established in 1876, and was followed by the establishment of the Cotton Bank in 1878. The system of weekly settlements was the next logical step in the development of the futures market, and this came in 1882.

It was, however, in another direction that the most important use of the futures contract emerged, viz., in its use as a "hedge" contract. It is difficult to define hedging, but in effect it is a means of insurance against risk by setting up for each contractual obligation a parallel or collateral contract which will work the other way, so that if the original contract results in a loss the other will produce a profit to set off against the loss. If, for example, a merchant has bought actual cotton under one contract, hoping to resell at a profit, he stands to lose if the market goes down; but if at the same time he sells futures under another contract, he will gain by the fall because he will be able to buy in at a lower price. The variety of risks that may be covered in this way is very great. To begin with the middle stage of the marketing process, where it was actually first used, it enabled the Liverpool merchants buying cotton in the U.S.A. for import into this country to avoid the risk of a decline in market value during the period of shipment, and while the cotton was waiting here to find a purchaser. Modern practice has developed the use of this method by introducing a modification in practice. Nowadays the requirements of spinners are so varied, and their exact fulfilment so essential, that they cannot buy merely "cotton," but must secure the exact grade and staple and style of cotton that they need. Now the "Futures" contract allows a considerable latitude in grade and staple, and a spinner buying such a contract would, therefore, have very little chance of getting among the cotton tendered against it any of

the particular cotton he wanted ; and so the custom has grown of dividing the business as it were between two contracts. The merchant or importer of cotton must find for each lot of cotton imported a spinner whose requirements are for just that kind of cotton, but in the meantime he hedges his American purchase of cotton by selling a futures contract in Liverpool. But he does not usually intend to deliver his actual cotton when it arrives against that contract. He could do so if he liked, and sometimes does, but as a rule it pays him better to sell each lot of cotton direct to a spinner who wants it. When he has succeeded in doing so he "buys in" his futures contract simultaneously, and the transaction is completed. If during its currency prices have fallen, he will not get as much for the actual cotton as he had expected, perhaps not even as much as he had paid for it ; but, on the other hand, he will be able to buy in his futures contract at a lower price, and this gain will offset his loss on the actual cotton.

This, then, is the system of hedging, and the advantages of it to business men in limiting their risks have proved so great that the same idea has been applied in many other ways. Indeed, such a development was inevitable, because the mere statement of the double transaction above described at once raises the question "How is it possible for these transactions to take place ? How do there come to be parties so conveniently available at both ends to take these risks off the importer ? Who in the Cotton Belt is prepared to take the risk of selling cotton so far ahead, and who in this country is prepared to buy cotton for distant delivery, and why ? "

The answer to the first of these questions is fairly obvious. Among the cotton growers there are many who follow the market intelligently, and when during the growing season they see cotton going to a price

which would be satisfactory to them, they are prepared to sell ahead against their growing crop. By so doing they secure a fair return for their crop, and avoid the risk of the market collapsing later on in the season, when the weight of the crop begins to press on the market. On the other hand, of course, if anything goes wrong with the crop, prices may rise and the grower who has sold ahead will lose the benefit, and may even find that his crop will not amount to as much as he has sold ; but he will not generally sell the whole of his crop until he can estimate the amount of it fairly accurately.

Again, there are in the Cotton Belt many far-seeing men, cotton merchants, factors, dealers, and exporters, who, being in close touch with the growers, can form an opinion as to the acreage and probable amount of the crop, and are, therefore, prepared to "take a view" of the situation and to sell ahead, relying on being able to buy from the growers when the time comes at a price which will leave them a profit for the risk. Thus a "market" is created on the supply side by those who are prepared to take the risk of estimating the probable supply and the consequent price.

When the crop actually begins to come in, the same method of hedging is adopted by the merchants and shippers in buying the crop. A local dealer in a small town market (or the local representative of a big New Orleans exporting house) is kept busy all day buying cotton from the small growers of the surrounding neighbourhood in many lots of a few bales each, or sometimes larger lots, and of varying grades and staples. At the end of the day he finds that he has bought, say, 100 bales of all kinds of cotton at prices based on the current price of the day in the principal markets, of which he is constantly advised. These bales will, in course of time, be sorted out into various lots of uniform

quality, sent to the compress, shipped to a big market for sale, or sold to his own customers, or perhaps exported to Liverpool or elsewhere. But all this will take several weeks or even months, and in the meantime the merchant cannot run the risk of fluctuations in the price of cotton, which may be enormous in such a period. On 8th Sept., 1926, for example, Spot Middling American was 10-36d. ; on 27th Oct. it was 6-60d. He therefore sells futures as a hedge, and this covers the major portion of his risk.

Turning now to the consuming end of the trade, we find that there is a similar series of risks to be considered. Suppose that a spinner is asked to quote for a big weight of yarn to be delivered over some months ahead ; if he does so without knowing what his cotton is going to cost him, he is speculating in the most dangerous way. There is, of course, one obvious way in which he could cover his risk, namely, by buying the actual cotton ; but there are several difficulties in the way of doing so, e.g. lack of storage, lack of capital, or perhaps the impossibility of getting at the time so much cotton of the particular sort required. He therefore bases his quotation on the prices of futures for the various months required by the contract, and when he books the yarn order, buys futures accordingly. A manufacturer booking a big order ahead will cover himself in the same way by buying his yarn ahead.

Or, again, a spinner may be offered a likely lot of cotton of the kind he is pretty sure to want during coming months, though he has not yet booked the orders which will call for it. But if he buys that cotton now and the market should go down, his customers will expect to get the yarn at the lower price, which would mean a loss to the spinner. If, however, at the same time as he bought the actual cotton he sold futures as

a hedge, then if the market goes down he will be covered for the loss on the actual by his profit on the futures.

In this way there has been evolved a system of distributing the risks of the whole process of growing, selling, shipping, spinning, and manufacturing cotton, so that each of the parties concerned bears only a small portion of the risk, and generally just that portion which he is best fitted to carry because it depends on conditions within his own knowledge. This is particularly desirable in the cotton trade because the characteristic feature of the industry is that it must always work far ahead. Cotton goods are not "made to order"; the manufacturers must anticipate demand, and even create it by putting before the public goods which will take their fancy; and especially in the case of season's goods this means making the goods months before they will be seen in the retail shops. That is essentially a risky business, and it is important that the risks should be minimized as far as possible by eliminating all unnecessary risks, and setting free each partner in the long system of production to mind his own business.

It remains to consider the economic effect of this system of intelligent anticipation—for that is the real meaning of speculation in the best sense of the word—in smoothing out the fluctuations of prices which result from the changing conditions of supply and demand. On the side of supply we have seen that the supply of American cotton depends on climatic conditions, which vary from season to season, and also from month to month in each season. If, therefore, those in touch with the growing conditions begin to see a big crop coming they will sell freely ahead, especially if owing to a small crop last year current prices are high, thus creating a discount on distant months. Consumers seeing this will tend to hold back current consumption, or at least to

delay buying against future needs, thus relieving the pressure on existing supplies, and checking the high prices. On the other hand, if current prices are low, but Manchester, watching the reports of a favourable monsoon in India, knows that good business will follow, the Indian shippers will be tempted to place large contracts for next winter's supplies; the manufacturers will buy yarn and the spinners their cotton, with the result that prices will tend to recover.

Unfortunately, however, the system of futures has provided the opportunity for speculators in the evil sense of the word, who have no legitimate interest to be hedged, to come into the market when conditions seem to be favourable for a quick turn in prices in the hope of making money on "differences" by "bull" or "bear" operations. These speculators have neither actual cotton to sell, nor any use for it if they bought it; but owing to the enormous "market" in futures created by legitimate hedging, they can always count on being able to sell out or buy in their contracts before they mature—at a price. This outside speculation is of extremely doubtful advantage to the trade. It is true that every additional buyer or seller helps to "make a market"; but such uninformed intervention in the market is nearly always one-sided, and it frequently results in a legitimate and necessary movement of prices being carried to extremes, because these speculators have little knowledge of the real conditions or prospects of supply and demand, and they generally follow the crowd. Fortunately, there is much less of this outside speculation in Liverpool than in New York.

It is necessary, however, to differentiate very clearly between the outside speculator, who knows nothing about the market except such "tips" as he may pick up from the newspapers or from his friends on the

Exchange, and merely gambles as a "bull" or a "bear" on differences, much in the same way as he would do on the Stock Exchange, and the "jobber" who fulfils a very important function in the market through his intimate knowledge of its workings. Jobbers are dealers in the ring who work for a quick turnover at a very small profit—a point or two either way for the day—and are the chief factors in maintaining the market, for they are always ready at a moment's notice to buy or sell, at a price, when they see an opportunity to make the turn. They are in a sense the middlemen of the market. If, for example, at a particular moment, say early in the forenoon, before New York is open, owing to the five hours' difference in time, a number of buying orders came into the ring when none of the brokers happened to have selling orders at limits near the current price, the bidding of the buyers might raise the market substantially before purchases could be effected. In such a case the jobbers, knowing that there will be a pressure of hedge sales from America in the afternoon, will take the risk of selling to meet the demand, hoping to be able to buy again later in the day at a few points profit. Frequently it is the other way about, the jobbers buying when there is pressure to sell, knowing that the fall of a few points will bring in buyers to whom they can unload. This is speculation of the most valuable kind, but it is generally confined within very narrow limits of time; the jobber as such does not mean to carry his contracts; his object is to be as nearly as possible square at the close of the day. It requires not only the fullest possible knowledge of every factor that is likely to affect either supply or demand in the market, but also the keenest possible "market sense," that instinctive power of feeling the pulse of the market, which comes only as the result of

long experience and the most intimate personal knowledge of the men who constitute the market, and the reasons which are likely to underlie and to dictate their course of action.

The next question is whether this system of hedging by futures is really effective, i.e. does it completely fulfil what is now its real function, viz., insurance against the risks of trading. On several points the answer cannot be an unqualified affirmative. In the first place, it must be recalled that the contract covers the holder against the fluctuations of only the basis price, i.e. middling, but the cotton to be delivered against the contract may be any one of several grades above or below middling, and there is no security or even likelihood that the differences between the prices of these grades and middling will be the same at the time of the completion of the contract as they were when it was made. Further, the contract does not specify any particular staple, except that the cotton tendered must not be less than "fair staple," a vague but well understood term, which means roughly not less than $\frac{7}{8}$ in. staple. This, of course, does not mean that staple is not taken into account in valuing cotton tendered against the contract; on the contrary, as will be explained later, full allowance is made for the actual staple. It only means that while in regard to grade the contract provides both a basis, or central point, viz., middling, and a minimum, viz., low middling, in regard to staple only a minimum is stated. This difference of treatment probably goes back to the time when all the American crop was more nearly of uniform staple than now, and when the spinners' requirements as to staple were much less exact than they are now. Nowadays, however, it would be quite useless for most spinners to look to deliveries against futures contracts to fill their actual

needs ; what they do, therefore, is to buy the actual cotton they require, when the time comes, on a spot contract, paying the current price for the particular grade and staple they want, and simultaneously sell out their futures. But there is again no security that the difference or points on which they will have to pay for that grade or staple will be the same as it was when they bought the futures contract ; and if it is not, then the futures contract has not completely covered them against the fluctuations of price ; it has covered only the movement of the price of middling, i.e. the basis price but not the points on.

In the same way, when a merchant or importer has sold futures against his actual cotton, it would not normally pay him to tender desirable cotton against the contract, because he can sell it to better advantage on the spot.¹ If he can do so he will immediately take in his hedge, i.e. buy back his futures contract. But if, owing to changes in market conditions, cotton of that particular class or staple is now commanding a smaller premium than when he bought it, his hedge gives him no compensation for that loss.

The fact that futures do not provide an adequate hedge against the fluctuations in basis or points on has led to the development of another form of contract which to some extent fills the gap. Unfortunately, the name by which this method is commonly known in Liverpool, viz., spinners buying "on call," is also misleading, because it has nothing at all to do with the now rare method of dealing on "put and call" or "double option." That was a system under which one individual agreed, on payment of a certain consideration, to either buy from or sell to another in the latter's option, a certain quantity of cotton at prices fixed in

¹ See page 84.

the option. The spinner's call is something entirely different. It is really a contract for delivery of a specific grade and staple of cotton, or a sale, on sample or type, of so many bales, deliverable at a fixed future date or dates, at a price of so many points on a particular month or months of futures, but the spinner has the option of "calling" the cotton, i.e. of fixing the moment at which the price is to be determined (by adopting the price of futures then as the basis price under the contract) on any date within a period specified in the contract, and which must not be more than thirty days after the actual delivery of the cotton. This, then, covers the spinner for his "points on," but leaves him entirely unprotected against the fluctuations of the basic price of middling. Of course, he could cover this also by buying futures, but that is seldom done, partly because it would mean paying double commission. Further, he hardly requires to do so, because he has probably not yet sold the yarns to be made out of the cotton; when he does so, the price will be fixed according to the current price of the raw material, i.e. the price of near month futures.

A similar practice has been developed in America under which the grower can sell his prospective crop at fixed "points on," but leaving it to him to "declare" or fix the basis price when the futures quotation is satisfactory to him.

But there is another point on which the working of the futures system has proved liable to abuse. Any grade of cotton down to low middling can be tendered against the contract, and it is alleged that at times this can be taken advantage of by large operators to "rig" the market. Thus if, owing to bad weather during the picking season, a particular crop happens to contain an unusually large proportion of low grade but tenderable cotton, certain large dealers can accumulate quantities

of these low grades which no one wants, sell futures against them, and then tender them on docket. But as the buyer cannot use this cotton and will have to sell it again, probably at a loss, he is inclined rather to sell out his futures ; and this sometimes results in a general tendency to "run away from the near month," thus depressing prices, which is exactly what the manipulators wanted. Note that it is not always low-grade cotton which is "undesirable" in this sense. It might be high grade or staple cotton ; in fact, any particular class of cotton which happens for the time being to be difficult of sale owing to the changing demands of the trade.

There are probably other ways in which similar manipulation of the market may be worked by large operators to their own advantage, and not necessarily always in the direction of depressing prices ; and as the cotton market is extremely sensitive to every wind that blows, the mere rumour of some such mysterious manipulation frequently sends the market off at a tangent, and drives prices temporarily in one direction or another, sometimes quite in opposition to the actual conditions of supply and demand, which it is the business of the market to reflect. The possibility of such drives is inherent in the system under which the futures contract is so closely bound to actual cotton by the necessity of tendering and accepting cotton as the final fulfilment of the contract. This, therefore, suggests a further question, which, though rather academic, is of great theoretical interest. Would it be possible to devise any other system of closing the contract, say, by fixing "striking prices" on some basis of relation to actual spot prices, at which the parties would merely pay and receive the final difference on the basis of middling, thus eliminating the question of the value of the particular grade of cotton tendered ? Such a system was actually brought into

operation during the war, when owing to the interruption of sea communications, the arrivals of actual cotton were so unreliable that sellers of futures might have been entirely unable to deliver cotton against their contracts. Under this system the futures contract became purely a "hedge" contract, or a speculative contract in the best sense, divorced from the necessity of delivering or receiving actual cotton, and it may be argued that such a contract is in theory the logical development of the idea of futures. The futures contract is in practice very seldom intended as a real sale or purchase of actual cotton. Its object is to insure the parties against the fluctuations of the basis price of cotton in general, and such an insurance could theoretically be provided by a "paper contract" which would represent the conflicting forces of supply and demand *in vacuo*. It is generally believed, however, that such a paper contract would lead to speculation of an entirely irresponsible character, and would aggravate all the evils that are to some extent inherent in any speculative system.

The tendency of recent legislation by the Liverpool Cotton Association in regard to its contracts has been in the direction of extending the scope of hedging possibilities, by providing a variety of contracts to suit the requirements of different kinds of cotton. The Egyptian contract was introduced in May, 1890, and this was followed by the splitting of the Egyptian contract into two—one for Sakel and the other for Uppers. This change was adopted by the authorities of the Alexandria market in 1920, and was followed by Liverpool in 1924, but apparently the new Uppers contract there has not been greatly taken advantage of, for in 1926 it was announced that dealings in that contract would be suspended after August, 1927.

In the meantime controversy had long been raging

as to the provision of a contract which would cover Empire cottons, including the better varieties of Indian cotton, and the new contract was launched in September, 1925. So far, however, it has not succeeded in attracting a wide or active market.

The actual working of the futures system may now be described in more detail as follows—The contract can only be made for lots of 100 bales of American cotton weighing 48,000 lb., or multiples of 100 bales. The wording of the contract is as follows—

Liverpool, 25th January, 1927.

“ We have this day { sold to } you, to be delivered
 { bought from }
ex Warehouse in Liverpool during March, 1927, 48,000 lb. AMERICAN COTTON, net weight to be contained in one hundred AMERICAN BALES, more or less, of any grade not lower than LOW MIDDLING (equal in colour to the standard and of not less than fair staple), or if tinged or stained, of any grade which (irrespective of allowance to Seller for staple) is at least equal in value to LOW MIDDLING (equal in colour to the standard and of not less than fair staple) at the price of 7·24 pence per lb. for MIDDLING (equal in colour to the standard and of not less than fair staple) with additions or deductions for such other qualities as are within the Contract according to their value as compared with the spot value of MIDDLING (equal in colour to the standard and of not less than fair staple) on the day the Cotton is tendered.

The price is stated in pence and decimals of a penny per pound, the minimum fluctuation being one hundredth of a penny, which is called a point, and represents £2 on 100 bales. Quotations commence with the current month, or “ near month,” as it is called, and the range of months quoted covers other 12 months ahead; it has sometimes been proposed that they should be allowed for two years ahead. Though every month is quoted certain months are always most dealt in, viz., January, March, May, July, and October, and these are known as the active months.

Unlike spot business which is done in the merchants' and brokers' offices and salerooms, futures contracts can only be made in the Ring in the Exchange itself, and only during official hours; there are severe penalties for trading out of hours or elsewhere than in the Exchange. While spot contracts are sold by patient negotiation between merchant and spinner, with the buying broker holding the balance, futures are sold in the ring by "open outcry." On the floor of the Liverpool Exchange there are three rings for the American, Egyptian, and Empire contracts respectively.

The actual method of trading is something like this—A shouts out, "I give two for Jan.," meaning, "I will buy for January delivery at 6.42d. per lb." B, from the other side of the ring shouts "Five," or "Sell you five," and waves his arm at A, holding up five fingers. A nods, and the transaction is complete. A has bought from B five hundred bales of cotton for January delivery at 6.42d. per lb. Everyone is shouting at once; probably seven or eight others have tried to sell to A at three, i.e. at 6.43d., or one point more than he offered.

Every transaction in the ring that involves a change in the price of any month is recorded on the board as it is made, and these quotations are printed every night in the official circular of the Liverpool Cotton Association. Mistakes are exceedingly rare, although during busy times in the ring an outsider sees only what looks like hopeless confusion.

After the market is closed contracts for each transaction are exchanged between buyer and seller. Only $\frac{1}{2}$ members of the Liverpool Cotton Association are allowed to trade in futures. A spot contract may be made between a merchant who is a member of the Association and a spinner who is not; but a futures contract can only be made between two members, who are liable to each

other for the payment of all differences due. Brokers have their own arrangements for reimbursement by their clients, but as far as other members are concerned they are principals and directly liable to their fellow members.

In the early days of futures all contracts used to run to maturity, the theory being that the intention of the parties was to deliver actual cotton at the due date; but as the use of the contract for hedging purposes developed, many contracts did not remain till maturity in the hands of the original purchaser, but were resold, and might pass through many hands before the date of delivery. Each of the parties who had held the contract for a time during the period of its currency would be due to pay or to receive a price, and, as a rule, there was a difference between his buying and selling prices, meaning that he had either lost or gained on the transaction. No payment, however, would be due either way until the contract expired, when the last buyer, being the holder of the contract at its expiry, would receive the cotton and pay the price to the last seller. He, in turn, would then pay the price under his purchase to his predecessor, and so on, and although each of these sales involved a separate and completed transaction, the intermediate buyers were not called upon to pay till the expiry of the contract. Thus if one man had bought 100 bales at 9-50d. and sold at 9-00d. he had a difference of £100 to meet, but would not be called upon to do so until the final settlement. This, however, produced a dangerous situation, for a speculator gambling in distant futures might go on for months losing money heavily, and when the time came for a final settlement be unable to pay. To obviate this risk, or at least to reduce it to a minimum, the system of weekly settlements was evolved. Every Monday at 11 a.m. the

Arrival Quotations Committee fixes the ruling price of each of the thirteen months quoted on the official board. All futures contracts open between members must be "settled" on these prices from week to week, and payments must be made through the Cotton Bank by the midday clearing on the following Thursday. These payments are subject to deduction of 5 per cent interest from the settlement date till the date when each contract is actually due, and the official due date is the 10th day of the month following the month of delivery called for. When a tender or delivery is made as each month comes round, the invoice date is the date of tender, and the Clearing House adjusts the interest payments made on account.

Delivery or tender must be made within the months specified, and either on the first or the last day of the month or at noon on any Tuesday or Friday during the month, at the seller's option. The document embodying the tender is known as a "docket," which is sent by the seller to the Clearing House. The weight of the actual bales tendered must not vary more than 1,000 lb. above or below the specified 48,000 lb. except under penalty, but the number of bales is specified at about 100 bales. The cotton when tendered must be in warehouse ready for immediate sampling and delivery, and it must be in a merchantable condition. No more than three marks or growths can be tendered under one docket, nor must the cotton lie in more than two warehouses. The buyer must pay cash before delivery, i.e. cash in exchange for delivery order, through the Cotton Clearing House, and this must be done within ten days of the date of tender.

Any quality of American cotton within the limits specified in the contract may be tendered, and it must be taken at its relative value to middling on the date of

tender. Grade refers to the amount of leaf and dirt in the lint, and to the dullness or brightness of the cotton. There are ten grades officially quoted every day. These are, beginning at the lowest quality—Ordinary; Good Ordinary; Strict Good Ordinary; Low Middling; Strict Low Middling; Middling; Strict Middling; Good Middling; Strict Good Middling; and Middling Fair. The three lowest grades are not tenderable on the futures contract.

Staple refers to the length and quality of the fibre; the longer the fibre and the stronger it is, the greater the value of the cotton. American cotton varies in length, roughly from $\frac{7}{8}$ in. to $1\frac{3}{8}$ in. A minute fraction of an inch in the length of the fibre adds appreciably to its spinning value. For instance, $1\frac{1}{8}$ in. may be worth about $\frac{1}{2}$ d. per pound ($\pounds 1$ per bale) more than 1 in., and full $1\frac{1}{8}$ in. worth a further $\frac{1}{2}$ d. per pound more. Any length of staple may be tendered, and the full value of staple is allowed for and must be paid for by the buyer, except that if it is over $1\frac{5}{8}$ in. only $\frac{4}{5}$ ths of the further extra value is payable. Fair staple is not defined, but it is a term well understood in the trade, and practically means the shortest staple generally used by the Lancashire trade, which is about $\frac{7}{8}$ in.

When the tender is made by the seller each actual bale of cotton is sampled in the warehouse by both parties (buyer and seller), and these samples are sent to the Liverpool Cotton Association's official Arbitration Rooms where their value, relative to middling, the basis of the contract, is arrived at by two experienced arbitrators, who, if they cannot agree, may call in an umpire. In the first place the arbitrators have to decide whether the cotton tendered is according to the contract, i.e. fair colour and staple, nothing below low middling. If the quality is thus within the contract, the value of

the particular grade and staple relative to the basis of the contract, i.e. middling, is determined as so many points on or off the basis price. Should the cotton class middling, fair colour and staple, then the valuation is pass (even) on the futures contract. Other grades and staples are valued according to the spot values and differences given in the "Daily Circular" on the day of tender. If middling spot is quoted at 30 points on futures, the arbitrators in judging a docket of middling will disregard these 30 points, because the contract is at a price which calls for basis middling. For other qualities the spot values are taken, but always less the difference between middling spot and futures. In the event of staple better than $1\frac{3}{8}$ in. being tendered, an allowance is given by the seller of 20 per cent of the excess value of such staple cotton over $1\frac{3}{8}$ in., i.e. he receives only 80 per cent of the additional value.

If either buyer or seller disagrees with the arbitrators' valuation, recourse can be had to the Appeal Committee, subject to notice being given before noon on the day following the arbitration. They re-value the cotton and issue their award, and if for any reason either party considers that a serious mistake in judgment has been made, then there is a super-appeal, which is made to the Board of Directors of the Association. The fees charged for arbitration are £1 rs. per 100 bales, for appeals £3 3s. per 100, and for a super-appeal a minimum of £10 10s.

Reference has been made to the peculiar use in the trade of the word "basis," and particularly to its use as meaning the "points on," given in the "Daily Circular" of the spot price of each grade over the near month price of middling. To explain why spot prices should always be above near futures it must be recalled that as the seller of a futures contract has the option of

delivering, or tendering, on any date of the month for which the contract is made, and can also tender any quality, or even three different qualities, on the one contract, it would seem that it would be difficult to find a buyer except at a relatively low price. The contract calls for delivery on the basis of middling, fair staple, and if a buyer requires for use at his mill, a precise quality of grade and staple, it is obvious that he would not fulfil his purpose if he took delivery under a futures contract on which any quality or qualities might be tendered. He is, therefore, willing to pay a slight premium on the price of futures contracts in order to get cotton which will comply with his precise needs. The result is that middling, fair staple, is always quoted on the spot at a premium over futures, a premium which increases or decreases according to the nature of the stock in Liverpool. In a normal season 90 per cent of the Liverpool stock would be tenderable. If there are buyers of middling at a premium of $\frac{1}{4}$ d. per pound, or 25 points over the quotation for futures for the current month, and if a seller tenders middling against his sale of a contract, he will get no allowance from the arbitrators above the contract price, for he has contracted to deliver middling or other cotton on the basis of middling. Obviously he would prefer to sell at the premium rather than deliver or tender against his sale of futures. Similarly with other qualities he would prefer to sell at their quoted spot values, for he must deliver on the basis of middling if he tenders, and if spot middling is at a premium of $\frac{1}{4}$ d. per pound over futures the seller would receive $\frac{1}{4}$ d. per pound below the spot value of the cotton tendered, whatever its grade.

Middling has held a premium over futures of from 10 points to 75 points during recent years, and anyone tendering or delivering against a sale of futures sacrifices

this spot premium. He has, however, the advantage of delivering qualities or grades which may not be in immediate demand, thus securing an immediate sale for such cotton, and he also secures a guaranteed payment. When a seller does not wish to deliver against his sale, because of sacrificing this premium, his remedy is to buy back the contract and sell for delivery in a later month. In actual practice it sometimes happens that there are more buyers willing to take delivery of cotton, thus securing cotton at less than its immediate spot value, than there are sellers willing to sacrifice the premium for an immediate sale, thus proving that the contract is attractive to buyers.

There is an interesting point in the connection between the amount of this premium of spot over the near month and the general character of "the Board" as it is called, i.e. the relation between the quotations of "near" and "distant" months. As a rule, the whole line of the quotations on the Board follows one of two directions; either there are premiums on the later months, each successive one of the twelve distant months quoted being a few points higher than its predecessor, or the reverse, the near month being the highest and each successive month lower, i.e. there are discounts on the distant months. The causes of the one state of affairs or the other are extremely complex, and the question of which is the more desirable from the point of view of different sections of the market, or of the industry as a whole, can hardly be answered with any conviction, but the following points may be noted: The main reason for a premium on the distant months would naturally be sought in the general position and prospects of supply and demand. It might seem to the layman that if a large crop is in view or already assured, the natural effect would be to depress the prices of distant futures, in view of the

expectation of lower prices to come. But in practice the effect is much more complicated. It is true that under such conditions the tendency would be for prices as a whole to fall ; but it does not follow that the distant months will be lower than the near. On the contrary, the effect of a big supply coming would probably be felt first and most by the near months in this way. The ruling factor in the price of the near months is the expectation of the buyers who hold contracts that cotton may be tendered, which they will have to take up. Now if there is at the time a large stock of cotton in Liverpool—more than can readily be sold at the moment (perhaps because spinners are holding off for lower prices)—and specially if there happens to be a preponderance of one grade or class of cotton in the stock which is at the moment difficult of sale, and therefore undesirable from the market point of view, then those who are “long” on the market know that they are likely to have cotton of that kind tendered to them, which they will have to sell at a loss or carry for some time. The “longs” may therefore be scared into selling the near month ; and if this is general the near month will be depressed, which in effect puts the distant months to a premium.

Again, if importers here or in America are able to pick up quantities of cotton out there at such a price that after paying charges for freight, insurance, interest, exchange, etc., they can land it in Liverpool at a cost approximately equal to the current quotation of the near months, they will do so, knowing that if they cannot sell the cotton on the spot they can tender it and lose nothing. Such a state of affairs, however, would normally result in lowering the premium of the spot quotation over the near month, hence the connection between that premium and the general aspect of the board. A low premium on the spot usually means that the

near month is depressed, and distant months go to a premium.

On the other hand, if a merchant who has imported cotton, say, in October, and hedged it in January futures, finds when January comes near that that particular class of cotton is for the time being difficult to sell, but the premium of spot middling over the near month is high, say, 50 points, he is unwilling to tender the cotton against the contract, for by doing so he would lose the premium. He prefers, therefore, to buy in his January futures and sell March instead (for he dare not go unhedged), and thus carry his cotton for another two months, by which time he hopes to sell the cotton at a better price. But the effect of this is to raise the price of the near months and depress the distant months; in other words, a high premium of spot over the near month tends to drive distant months to a discount.

Note, however, the other side of this transaction. Carrying the cotton costs money for warehousing, insurance, interest, etc., perhaps as much as 10 to 15 points a month. If, therefore, March futures are already at 20 points below January, the merchant will lose that difference when he transfers his hedge, plus the 20 or 30 points of carrying charges for two months, which means that he may lose as much that way as the other way. What the merchant likes is to see a good "carrying premium" on the Board, i.e. every month a little higher than its predecessor, so that if he decides to carry the cotton, the gain he makes on transferring his hedge will go against the carrying charges, and he can afford to hold his cotton until the spot market improves.

This is merely one illustration of the extraordinarily complicated reactions which influence the Board. The prospects of the coming crop as to both quantity and quality, the nature and amount of the stock in Liverpool,

or at sea headed for the port, and the state of demand, present and prospective, for cotton generally, and for particular classes of cotton, all enter into the question.

One other term in constant use in the market remains to be explained, namely, "straddle." Unlike so many of the technical terms used in the market, this almost explains itself. A straddle means any operation which implies bridging the gap or covering the "spread" between two values, by buying the one which seems low at the moment, and selling the other which is relatively high. It may be between near and distant months in one market, though that is more strictly called a "swop," or between the same month in different markets, e.g. Liverpool and New York. Thus the normal parity between these two markets depends on the charges for freight, insurance, interest, etc., the rate of exchange between cents and pence (or dollars and pounds sterling), and also the fact that the New York contract is gross weight, while the Liverpool contract is net, resulting in a difference of about 6 per cent for the weight of bagging and bands. In normal times, therefore, if the price in New York is, say, 12 cents, the price in Liverpool ought to be about 6d. plus 60 points, i.e. 6-60d. If the difference is less than that, the presumption is that either New York is too cheap or Liverpool is too dear, and straddle operators will buy the one and sell the other, which will tend to widen the difference and so adjust the parity.

Again, a straddle may be between two different kinds of cotton, e.g. American and Egyptian, either in Liverpool, which is the only futures market where both are constantly quoted, or in two different markets, e.g. buying American in New York or New Orleans and selling Egyptian in Alexandria, or again between Sakel and Uppers in Liverpool or Alexandria.

Something must now be said as promised of the personnel of the Cotton Market as a whole, including both the Spot and Futures sections. Liverpool cotton men may be roughly divided into four classes, importers, merchants, selling brokers, and buying brokers, but all of these overlap to some extent, except perhaps the last two. In the early days of the trade the importers were general merchants who did not specialize in cotton, but were importers of mixed cargoes of many kinds of foreign produce, frequently in their own ships, e.g. the famous triangular trade which carried manufactured cottons, etc., to West Africa, sold them there and bought slaves, who were carried to the West Indies for sale to the planters there, while the ship took on a cargo of West Indian goods, including cotton, and so returned to Liverpool.

These importers sold most of the cotton to dealers, who resold in smaller quantities to the spinners, and it is of special interest to note that at first most of these dealers were in Manchester and other cotton-spinning towns, which probably accounts for the growth of a special trade of brokers in Liverpool. The importers sold sometimes by auction, the sales being conducted by the importers themselves or by brokers employed by them for the purpose, and also direct to the dealers, who sometimes came to Liverpool to attend the sales, but more frequently employed brokers to do so, and buy for them. Even at this early stage, therefore, the distinction between buying and selling brokers had begun ; but most of the brokers dealt in other commodities as well as cotton, and it is probable that a broker who usually acted as seller's agent might have on occasion a commission to buy for someone else. Direct sales by importers to spinners were not unknown, and sometimes the spinners themselves would buy at the sales through a broker, thus cutting out the dealer, but this was

probably exceptional. On the other hand, some of the larger dealers were really merchants, importing their own cotton direct, and holding large stocks.

The growing volume of the cotton trade, and the increasing share which Liverpool began to take in the import trade from 1790 onwards, meant more business for the brokers, who began to specialize in cotton alone. The next change in the system was the practical elimination of the Manchester dealers, as the spinners found it better to employ brokers in Liverpool. This probably began about 1810, and developed rapidly after the opening of the Liverpool and Manchester railway in 1830. Many of the Manchester dealers removed to Liverpool, while other new brokers there were relatives of dealers or of spinners.

The earliest attempt to organize the Liverpool trade sprang from the need of trade statistics, and the first trade circular dealing with cotton alone began in 1805 in the form of a weekly account of sales, imports, etc. The multiplication of the brokers' periodical reports, the preparation of which largely depended on mutual assistance, finally suggested the idea of the General Circular, first published in 1832, which contained statistics of the imports, sales, stocks, and prices current of all foreign and colonial produce, including cotton. The collection of the cotton statistics required weekly meetings of all the brokers at the office of different firms in turn, and out of these meetings developed the Cotton Brokers' Association in 1841, which, however, did not begin the publication of an official circular till 1864. Their first "rules" had only been established in the previous year.

After the establishment in 1876 of the Clearing House, which was only open to members of the Brokers' Association, considerable friction arose between the brokers and

the merchants who finally, in 1881, established a rival Association, called the Liverpool Cotton Exchange ; but there was obviously no room for two separate organizations, and in 1882 they were amalgamated into the present Liverpool Cotton Association, which embraces all the various classes of cotton importers, merchants, and brokers, and even spinners as Associate members.

The chief development of recent years has been the gradual mingling of the functions of the various parties on the selling side. Selling brokers may themselves be importers or merchants either on their own account or as representatives of large shipping firms abroad. Many of the latter now have their own offices or their special representatives on this side. But the distinction between selling and buying brokers has never been broken down ; in fact it is probably more definite now than ever. The persistence of these two separate classes is probably the best evidence of their economic justification, and of the real utility of the functions they perform. They are not merely redundant middlemen, but actually skilled representatives of the two parties to a bargain in which intimate knowledge of the commodity and of the consumer's requirements is essential and worth paying for. It should, however, be noted, that the necessity for such skilled assistance is partly the result of the peculiar conditions of the trade, especially as regards American cotton. If all cotton were roughly the same, or if all cotton were imported in lots of 100 bales, all homogeneous and even running, spinners could buy their cotton c.i.f. from the exporter in America, as they do to some extent in Egyptian. But in American practically every bale is different, and it requires expert knowledge to examine every lot and see that it is just the kind of cotton the particular spinner wants for his special purpose at the time.

In regard to futures business, however, all distinctions between the different classes of traders in the market disappear, and any member may deal in futures, with any other. The primary interest of the various traders in actual cotton is, of course, to hedge the transactions of their various clients ; but they are in no way limited to that, either by rule or even by etiquette. Any firm may do futures business for outside clients who have no interest in actual cotton, and which is therefore speculative. They may operate at times on their own account, or may do a regular business as jobbers. There are even a few firms on the market who do no actual spot business at all, but confine themselves entirely to futures business ; and there are also certain individual members whose business is almost exclusively as jobbers on their own account, but both these cases are entirely exceptional. On the whole most of the business in futures on the Liverpool Cotton Exchange is really hedging of one sort or another, and the participation of the outside public in any important volume is confined to times of excitement when some dramatic change in the market, generally a spectacular rise, attracts a good deal of outside interest.

The foregoing description of the actual working of the futures system may be concluded by a more detailed description of the various classes of traders in cotton, not only in Liverpool but elsewhere, who make use of the futures market either for the hedging of their legitimate interests in cotton or for more or less speculative purposes. These may be roughly tabulated as follows—

(a) *In U.S.A.* 1. Parties who have to sell hedges. The first are the cotton factors in the various centres of the Cotton Belt, who having financed the planters during the growing season, take their crop in payment, accounting to the planter for any balance due over the

amount of their advances. As soon as the cotton comes in they sell hedges against it and then proceed to realize through ordinary spot channels. Some of the larger planters and estate owners, however, sell futures themselves, sometimes against the growing crop. Again, the ginner in the South frequently buy the planter's bale from him immediately it is baled, paying him the local market price (in some cases they used to take the seed as payment of their charges for ginning, etc.). The ginner will then sell hedges as soon as they have accumulated a sufficient number of bales.

2. Parties who may either buy or sell futures, as occasion requires. F.O.B. dealers buy cotton from the growers or ginner in the Belt, but not being exporters or in a position to sell direct to spinners, they resell to other merchants in the larger centres and ship the cotton to them F.O.B., i.e. at the buyer's charges for freight, etc. In the meantime they cover the risk of market fluctuations by selling hedges. More important, however, are the merchants or shippers. In the U.S. the two terms are practically synonymous, for in America "shipping" goods is applied indifferently to land as well as sea transport. Thus a shipper in the South may sell cotton to (a) an American mill, either in New England or in the South, (b) a Liverpool or Manchester merchant, or a Lancashire spinner, (c) a Continental importer or spinner, or (d) similar buyers in other foreign countries, such as Japan, India, etc.

(b) *In the Importing Countries.* Merchants, importers, and dealers in actual cotton in Liverpool and Manchester, or on the Continent, require to either sell or buy futures as hedges against purchases or sales of actual cotton or against forward sales or purchases, e.g. sales of cotton "on call" to spinners.

(c) *Spinners and Manufacturers* in either America or

Lancashire, on the Continent or in other cotton consuming countries, require to sell or buy futures against their purchases of cotton or sales of yarn or cotton goods.

(*d*) *Operators* in the various markets, (*a*) on Straddles between the different markets, trading on the relative parities between markets, or between different months in the same market, or between different kinds of cotton, e.g. American and Egyptian; (*b*) *Speculators* who buy when prices seem too cheap (bulls) and sell when too dear (bears); (*c*) *Dealers* who trade from day to day professionally, and who help to steady the market and absorb any temporary surplus of contracts or supply contracts when temporarily scarce; and (*d*) *Jobbers* who rarely have contracts open either "long" or "short" for more than a few minutes or hours. They must know how to balance their books each day for each month traded in, and they do this by knowing who wish to transfer hedges from any given month to another at given differences. They lead a strenuous and harassing life, and deserve the very small profit they make on the turnover. Without them the futures market could not work at all.

This chapter being avowedly a description of the Liverpool Cotton Market, no attempt has been made to describe the detailed differences in practice or methods between Liverpool and the other cotton markets of the world. To do so would be impossible in view of the restriction of space, and is perhaps hardly necessary, for the principles are the same in all markets. A word may, however, be said of the general character of the other markets. Liverpool is more of a hedge market than any other. It is always in immediate touch with spot cotton, because there is normally a stock of half a million to a million bales or more actually lying in Liverpool warehouses. Its geographical position makes it a

natural world market, and owing to the difference of time the hours during which it is open overlap both New York and New Orleans in the West, and Alexandria and Bombay in the East. It is also the basis for the huge cotton consuming hinterland of Lancashire. New York is mainly a financial market, and though sometimes considerable stocks of actual cotton lie there, mainly for manipulation purposes, it is not a real spot market. Actual cotton there is only an accessory to futures ; in Liverpool spot cotton is directly in contact with the futures contract. On the quotations of New York futures Southern cotton merchants and American and Continental spinners fix prices, and bankers rely on these quotations for values. New Orleans is a large spot market for certain qualities of cotton, and there spots and futures are closely related, as in Liverpool, but it is a smaller market than Liverpool, and not so well balanced. A futures market was opened in Chicago in 1926. There are also futures markets in Bombay for Indian cotton only, and in Alexandria for Egyptian. Havre and Bremen also have cotton markets, which deal in both spot and futures.

III. FINANCING RAW COTTON

The financing of the American cotton crop may be said to begin when the farmer borrows part of the wherewithal to raise his cotton. He obtains an advance from a local bank, or he becomes indebted to a factor who supplies him with fertilizers and other necessaries ; in the latter case, the factor probably borrows from the local bank part of the funds with which he, in effect, provides the farmer. When the cotton is ginned, the document representing it will be handed to the bank. The document of title is usually a compress receipt, an

American warehouse receipt, or a local railroad bill of lading. The compress receipt and the American warehouse receipt differ from a Liverpool warehouse receipt in that they are negotiable ; in the former case the title to the cotton can be conveyed by endorsement and delivery of the document, but for the conveyance of title to cotton stored in Liverpool a new warehouse receipt must be obtained. The local railroad bill of lading is a negotiable document under which the cotton is carried from one railroad point to another, the destination usually being either a point where cotton is concentrated or a port of loading. Besides holding the document of title, the bank holds some document of insurance entitling it to collect direct the amount of any claim for loss by fire.

When the cotton is bought by a shipper he has to arrange, and prepay, freight to Liverpool, and to obtain, in exchange for the already existing document of title, a bill of lading to Liverpool. There are in use two chief forms of bill of lading, namely, the Through Bill and the Direct Bill, each of which is again subdivided into two kinds.

The two kinds of Through Bill are the Through Railroad Bill and the Transshipment Bill. The former is signed by a railroad company, which undertakes to carry the cotton from the interior point to the port of loading, and to deliver it there to some specified steamship line for shipment to Liverpool. The latter is used where the cotton is to be carried coastwise by one carrier to a port where it will be handed over to another carrier for shipment to Liverpool.

On a Direct Bill there is only one carrier, the route being simply from the port of loading to Liverpool. The two kinds of this bill are known respectively as the Custody Bill and the Port Bill. Where a Custody

Bill is used, the cotton must be in the port on the date of the bill of lading and "delivered to" the authorized agent of the ship, but the ship need not be in the port at the time. The cotton must be shipped, i.e. received "on board," within three weeks of the bill of lading date, but substitution of another vessel—even of different ownership—than the one named in the bill of lading is permissible in case (a) the named vessel is lost, or (b) of accident or other unforeseen event of *force majeure*. A Port Bill is used only when both the vessel and the cotton are in port on the bill of lading date and the cotton has been "delivered to" the authorized agent of the ship. The words "delivered to" are sometimes construed, both in the case of a custody bill and in that of a port bill, to mean merely that the cotton is in a warehouse, or at a railway depot, within the port, and is unconditionally at the disposal of the steamship line.

Whenever a through bill or a custody bill is used, a "Master's Receipt," or "Agent's Receipt," is issued by the final carrier, and sometimes this is issued even in case of a port bill. The reason is that even a port bill does not usually show that the cotton has been received "on board"; the agent's receipt states that the cotton has been received actually "on board," and will be delivered to the holder of the agent's receipt and the bill of lading specified therein. It fixes responsibility definitely upon the ship named in it.

Bills of lading, compress receipts, and warehouse receipts are all documents of title, but a bill of lading differs from the others in that it is also a contract of carriage. When the document is further complicated by the fact that there are two carriers, each of whom will try to put the responsibility on the other in case of loss or damage, or of delay in transit, it is obvious that a through bill of lading contains plenty of possibilities

for dispute. Some years ago these were frequent, and importers sustained losses in consequence. However, in 1907, a form of bill of lading known as the "Through (Conference) Bill of Lading" came into existence, largely owing to the efforts of the Liverpool Cotton Association; and the general adoption of this form by shippers has greatly lessened the risk connected with the use of through bills of lading. Custody bills and port bills, as well as through bills, are issued "under agreement with the Liverpool Cotton Bills of Lading Conference (1907) Committee and the American Bankers' Association." While the work of the Liverpool Cotton Association prior to and during 1907 was undertaken for the benefit of cotton firms, it has probably had its effect on the conditions of carriage of other commodities and benefited indirectly all traders who use through bills of lading.

The shipper, having obtained a bill of lading to Liverpool, attaches it and the Marine Insurance Certificate to a sterling draft, at sight or three days' sight on a Liverpool merchant, or at 60 or 90 days' sight on a bank or an accepting house. He hands them to the local bankers, who forward them to their New York agent. The shipper also draws a dollar draft at sight on a New York dealer in foreign exchange, called a "bill buyer," and his bank forwards the dollar draft, along with the other things, to their New York agent, who presents it to the bill buyer for payment. The bill buyer pays it and receives in exchange the sterling draft and the shipping documents, viz., the bill of lading and the Insurance Certificate. The bill buyer's payment of the sight draft discharges the shipper's indebtedness to the local bank. The bill buyer forwards the sterling draft and the shipping documents to his agent in this country, who presents the draft, for payment if it is at

sight, or for acceptance if it is at 60 or 90 days' sight. In the former case the draft is paid on presentation and the documents surrendered to the importer on payment. In the latter case the bank, or the accepting house, "accept" the draft, first getting specific instructions from the importer to do so. The act of accepting the draft consists in the banker writing across the face of it in some such form as this: "Accepted, 18th July, 1925, payable at — Bank, Ltd., London," and signing his name immediately below. The banker or the accepting house, by accepting the draft, undertakes responsibility for its payment at maturity, that is, 63 or 93 days, as the case may be, after date of acceptance.

The accepting houses are old-established London firms who originally traded as merchants. Their great wealth and high repute led smaller firms to ask them to accept, for a commission, drafts which would normally have been drawn on the smaller firms against produce. The commission paid to the accepting house was, of course, less than the gain in price, which the smaller firm obtained by being able to provide a better reimbursement than its own name. In time this business became so large that many of the London merchants devoted all their attention to it; and to-day most of the accepting houses do no mercantile business whatever, but confine themselves to accepting drafts for trading firms. The accepting houses are naturally proud of their pedigree, and are careful to speak of themselves simply as "merchants," by which name they are described in the *Bankers' Almanac*. However, the general public finds it more convenient to call them "accepting houses," in order to distinguish them from firms who handle merchandise to-day. For convenience the word "bank" will be used to mean either a Joint Stock Bank, though not necessarily one of the "big five," or an American

Bank established here, and the word "banker" to mean either an accepting house or a bank.

When bankers accept drafts, the documents are surrendered to them. The accepted drafts, when no longer encumbered by the documents, are usually re-discounted; probably most of them are bought by the big banks. The shipping documents are not handed to the Liverpool importer, but are retained by the accepting banker until arrival of the cotton.

The document by which the marine insurance is originally effected is usually called an "Open Cover"; it is an agreement by which the Insurance Company undertakes to insure all the cotton shipped by the shipper during the season. It covers the cotton not only against marine risks, but against virtually everything that can happen to it from the moment it becomes the property of the shipper until it is warehoused in Liverpool; hence a claim can be made under it for a fire in America hundreds of miles up country. The Open Cover cannot conveniently be included in the shipping documents, because the drafts of one shipper are bought at various times by various bill buyers, of whom only one could hold the Open Cover; hence another document, the Insurance Certificate, accompanies the bill of lading, and it is on this certificate, countersigned by the Insurance Company, that the holder of the documents would rely in case of loss or damage. The certificate specifies the amount of insurance applying to a particular lot of cotton; and the banker holding it and the bill of lading can claim direct on the insurance company, even though the shipper has not paid the insurance premium. The function of the certificate is to protect the holder of the bill of lading and to settle beforehand the amount of insurance on the particular shipment. The function of the Open

Cover is to detail the terms of the insurance more fully than the certificate can do, and to protect the shipper from the moment the cotton becomes at his risk ; for without the Open Cover he might incur a loss if the cotton were burned between purchase of the cotton and issue of the certificate.

If the cotton is lost at sea and there is a considerable advance in the market since the certificate was issued, the merchant does not merely lose a profit, but incurs an actual loss ; for he depends on the rise in value of the cotton to recoup himself for the difference he has to pay on his hedge. It is possible to arrange a special additional policy by which any increase in value due to a rise in futures is covered automatically as it accrues.

About the spring of 1910 various Liverpool firms lost heavily owing to the forgery of bills of lading by an American firm. As a result, the American bankers devised precautions to prevent forgeries in future. One of these is the Validation Certificate, which is attached through railroad bills of lading and states that the signature on the bill of lading is actually that of the man purporting to sign, and that he is the authorized agent of the railroad. The persons who sign these certificates are sometimes not very responsible and are frequently careless. Sometimes the Validation Certificate does not apply to the bill to which it is attached ; at other times no name is inserted in the Certificate as that of the person signing the bill of lading, and sometimes the Certificates themselves are unsigned. Pressure is being exerted from this side to remedy these defects, but the value of these Certificates is at present very doubtful.

Probably a more real safeguard is the Central Bill of Lading Bureau, which receives a copy of every through bill issued by the railroads. Bill buyers can, by referring to the Bureau, verify the validity of all the bills they

handle. Whether they actually do so is another matter.

When the shipper sells to the Liverpool importer, he reckons on selling his sterling draft at a certain rate of exchange. If he delays fixing the rate, he may find that he has to take a worse rate next day, and his profit may have vanished. It is as important to him to fix his rate simultaneously with his sale as it is to the Liverpool importer to hedge at once when buying the cotton.

The sterling drafts mainly used for cotton are (a) sight on the importer, or (b) 60 or 90 days' sight on a bank. The rate for sight is always higher than that for sixties, which in its turn is always higher than that for nineties. The difference between these rates is chiefly due to interest charges; for the sight bill becomes due for payment on arrival here, and the other two 63 and 93 days respectively after arrival. (A small amount of the difference between sight bills and the other two kinds is due to the fact that on bills at more than three days' sight the London agent of the bill buyer has to affix stamps, at the rate of 1s. per £100, to the drafts when they arrive here.) The rate of interest on which the bill buyer works when calculating what difference he must make between sight and sixties, and sixties and nineties, is the rate at which his London agent will probably be able to discount the bills after acceptance. If, however, you try to work out, from the London discount rates and the New York sight exchange rate, what the ninety days' exchange rate should be, you will probably get something quite different from the ninety days' rate quoted in the newspapers; the published rates for "cable transfers" are correct, but the other published rates are often incorrect.

When the cotton arrives, the banker hands the bill of lading either to the merchant or to a warehouse

keeper, with instructions to house the cotton in the banker's name. Handing the documents to the importer has before now entailed serious loss to bankers and others. Such losses ultimately fall on reputable importers, to whom the banks must charge higher rates in order to recoup themselves. Importers would be wise always to insist that documents should be handed to the warehouse keepers, not to themselves. The importer gives a letter to the banker, stating that he has fire insurance against the cotton and will pay to the bank the amount of any claim.

Merchants frequently sell cotton to spinners before it is shipped, before they have bought it, and sometimes before it is grown. Some explanation of the working of hedges is necessary in order to make clear the financial consequences of selling at a fixed price.

If a Liverpool cotton firm buy, say, 100 May futures at 20d., they are compelled in effect at the end of the week to sell 100 May futures and to buy 100 May futures, at a price to be struck the following Monday morning. If the striking price is 19d., the difference between the original purchase and the compulsory sale shows £200 to be paid by the firm; payment is actually made the following Thursday, less interest to 10th June. The compulsory purchase at 19d. will, if not closed by a voluntary sale, remain open till the end of the week, when another compulsory sale and purchase will take place, and so on, till an actual sale occurs and is brought into account. This system of weekly settlements is applied to all "futures" contracts. It follows that, if a firm hedges a spot purchase of 100 bales of actual cotton by selling May at 15d., and if May is struck on the following Monday at 14d., the firm will receive in the settlement £200, which is approximately the amount by which their bank will ask them to reduce the loan on

the cotton, because of the fall in value. If, on the second Monday after the voluntary sale, May is struck at 16d., the firm will have to pay £400 in the settlement, and their bank will allow them to draw that amount, which represents approximately the rise in value since the previous week. Hence, although fluctuations in the price of futures entail receiving money in the settlement and paying it into the bank, or vice versa, they hardly affect the amount of the merchant's free assets.

Now suppose a merchant has cotton that he is willing to sell for May delivery at 100 points on May, and that a spinner is anxious to secure it at 100 points on May, but is afraid to increase the volume of cotton on which he is running the risk of the market. The difficulty is met by the merchant selling the cotton to the spinner "On Call," at 100 points on May. That is to say, there is an actual sale without the price being definitely fixed; the price is to be fixed any time the spinner chooses, before the end of May, at 100 points on the quotation for May futures current at the time the spinner exercises his option to "call" the cotton, i.e. to fix the price.

Let us assume that at the time the contract is made May futures are 18d.; if the cotton were called at once the merchant would get 19d. for the cotton and would buy back his May futures at 18d. But if the cotton is called at a later date, when May futures are 15d., the merchant will get only 16d. for his cotton. Therefore, he must not buy in his hedge when the contract is made, but must leave it out until the cotton is "called"; price fluctuations will not then cause even a temporary decrease or increase in his free funds so long as the sale remains "on call," i.e. so long as the price is unfixed.

Let us now see what happens when the merchant has forward sales open at fixed prices; and let us

include in the term "fixed price sales" any sales originally made "on call," but called later. We must bear in mind that forward sales, being sales of "actual" cotton, are not subject to weekly settlements, as futures are. There are three cases to consider, viz. (a) when the importer sells at a fixed price simultaneously with his purchase, (b) when he sells at a fixed price prior to his purchase, and (c) when he sells at a fixed price subsequently to his purchase.

In case (a) there are no futures. The importer buys and takes delivery of actual cotton at, say, 20d., which he sells for delivery some months ahead at 20d., plus a margin of profit and carrying charges. If the value of the cotton declines to 18d., the bank ask him to reduce his loan by the amount of 2d. per lb. on the cotton. His free assets are reduced by the amount of the fall in value of the cotton sold, and if no further change in value occurs he will be out of pocket 2d. per lb. until he receives the sale proceeds some months later.

In case (b), when the importer sells actual cotton without buying actual cotton, he hedges by buying May futures at, say, 20d. If May futures decline to 18d., he has to pay in the settlement 2d. per lb. on the quantity of futures bought or, which is the same thing, on the quantity of actual cotton sold. At this point, when May is 18d., he buys actual cotton, selling out his futures simultaneously at 18d. He will have nothing more to pay or receive on his futures; but if the price of May declines further to 17d., the bank, who are financing the actual cotton at the purchase price level of 18d., will ask him to reduce the loan by 1d. per lb. This, with the 2d. paid in the settlement, makes a lock-up of 3d. per lb., which is the exact fall in the price of May futures since the fixed price sale.

In case (c), let us suppose that the merchant sells

actual cotton when May is quoted at 20d., after he has already bought the cotton. Any fluctuations occurring while the cotton remained unsold, have, as already explained, made no difference to his free assets; but when he sells the cotton, he buys in his futures at 20d. Hence, if May subsequently declines to 18d., which means that the value of his actual cotton declines 2d. per lb., he will receive nothing in the weekly settlement wherewith to pay against his loan when the bank ask him to reduce it.

In each case, therefore, the merchant's funds are locked up until he receives the sale proceeds; and the amount locked up is equal to the fall in value from sale price to current price on the quantity sold. Of course, in case of a rise in market, his free assets are increased; but an increase of free assets in March which vanishes in April will not help him when May comes and he has to lock up part of his own capital.

The extent of the financial embarrassment arising from fixed price sales is relatively much greater than that due to speculation. A firm who would not go 100 bales long or short will cheerfully face the risk of a lock-up of funds involved in selling ahead 20,000 or 30,000 bales of actual cotton.

The risk of embarrassment is more serious to a firm whose stock is all sold, and whose ultimate profit is therefore secured, than to a firm whose stock is all unsold and may ultimately be sold at a loss. The safer the profit-and-loss position, the greater the risk of embarrassment meantime.

The risk sometimes materializes quite suddenly. If a merchant has 25,000 bales sold, of which only 5,000 have been called, he may think himself safe; but an unexpected fall in the price of futures may cause spinners to call freely, and the merchant's sales "on call" thus

become sales at fixed prices before he can turn round. If the fall still continues, his position may become critical. He cannot count upon getting a banker or a broker to finance the sale contracts, unless notice in legal form is served on the buyers; even then, spinners will be afraid to buy from him in future, with the result that he may be unable any longer to trade in his own name. Still, anything is better than going into forced liquidation, for his capital might be completely lost in the process of liquidation, owing to causes to be discussed later.

There is no sure way of providing against the risk arising from fixed price sales; it is one that every firm must take. To what extent they should do so depends largely upon how far they could get help from outside at a pinch.

When spinners require delivery, the bank usually releases the cotton against the merchant's trust, undertaking to hand them the sale proceeds as and when received, but in any case within ten days. If the cotton is financed on a 60 days' bill which matures soon after the sale proceeds come in, well and good; but if the bill has, say, 38 days to run after receipt of the sale proceeds, what then? We saw, when discussing exchange rates, that the extra cost to the shipper, of reimbursement by 60 days' sight draft instead of by cable transfer, is essentially an interest charge; he would sell at a correspondingly lower price if payment were by cable transfer. The merchant has therefore, in effect, paid for 76 days' finance (from date of drawing in U.S.A. to date of maturity of the bill) in the price at which he bought the cotton in U.S.A. Suppose that the interest charge was at the rate of 5 per cent per annum, including accepting commission. Now when the merchant pays the sale proceeds to his bankers, they allow him, say, only 2 per cent rebate for the 38 days that the bill has

still to run ; the consequence is that for the time he has actually used the finance, it has cost him not 5 per cent but 8 per cent per annum. If he had arranged for a draft on himself at sight instead of on his banker at 60 days' sight, and had met the draft by getting a loan from his bank, he would have financed at about 5 per cent instead of 8 per cent. This would mean a saving of about one-third of 1 per cent of the value of the cotton. But over a series of years his average net profit, after paying office expenses, would not probably exceed 1 per cent of his turnover, even if he financed well. Then, with the handicap of one-third per cent loss in rebate, his average profit is only two-thirds per cent, which he could increase by one-half if he could stop that rebate loss. These figures are exaggerated, because sale proceeds will not often be received as much as 38 days before maturity of the bill. But it is probably not an exaggeration to say that the importation profit of a firm who habitually buy on Port Bills of Lading might be increased 10 per cent to 20 per cent if they could avoid loss which they have hitherto incurred by paying under rebate.

The loss can be avoided if the shipper draws at sight, or if the bankers agree that, instead of paying the proceeds when received, the merchant may deposit fresh cotton in substitution for that delivered. Virtually all accepting houses allow substitution, but there is some diversity of practice among the banks ; some allow it, others do not.

When a merchant pays cash to the bank against the bank's unmatured acceptance, the bank have the use of the money till the bill falls due, and they presumably make something out of it. However, the handicap to a merchant who is not allowed substitution is so great that the progressive diminution in import profits must

tend to make the cost of non-substitution bills prohibitive. Those banks who do not at present allow substitution might agree to do so if they could be freed from certain risks that they run at present and which we must now consider.

When dealing with fixed price sales it was mentioned that if a merchant who is perfectly solvent is forced into liquidation because his assets are too much tied up, his capital may be completely lost during the process of liquidation. This is because as soon as he fails to meet his differences in the weekly settlement, his sales of actual cotton, and his hedges against unsold cotton, are of necessity closed out automatically; the whole of his stock, including what would otherwise have been delivered against open sales, is consequently left unhedged. Hence his bankers, or his brokers if he is financing with brokers, wish to sell the cotton immediately, regardless of "points on"; for if the stock declines in value, the bankers or brokers will bear the whole loss, but if it increases in value they will have to hand over to the liquidator any surplus after satisfying their claim. But cannot the bankers or brokers put out hedges against the stock pledged to them, so as to avoid the necessity for forcing the sale of cotton? A few years ago a firm of brokers, financing a merchant who failed, put out hedges against cotton pledged to them. The market advanced, and there was a loss on the hedges of about £40,000, with a corresponding increase in the amount which the actual cotton realized when sold. The creditors then demanded that, when settling with the liquidator, the brokers should account for the full proceeds, including the £40,000 increase, without deducting the corresponding loss on the hedges. The brokers did so, presumably because they found on inquiry that it was doubtful whether they could legally refuse.

The banker or broker has an alternative to actually selling the cotton at slaughter prices. He can sell the near futures position, and then tender the cotton against the sale of futures. This, however, will probably entail as heavy a loss as actually selling the cotton regardless of points on. Moreover, the cotton may have to be re-lotted and re-warehoused to a considerable extent, to make it conform to the conditions under which it can be tendered. These operations take time, and until it is certain that there will be no hitch in getting them done before the current month expires, it is unsafe to sell futures with a view to tender. Meantime the bottom may be dropping out of the market, and the stock is unhedged. If much of the stock is at sea, or not yet sailed, there will be still further delay in disposing of it, and the possibility of loss will be proportionately greater. The combined losses arising from selling regardless of points on, from tendering, and from a fall in the price of futures, may, in some cases, be sufficient to wipe out the firm's capital.

The uncertainty as to the legal position of bankers, if they hedge, not only prevents them taking steps to safeguard the interests of other creditors, but increases their own risk of loss. If their position could be made safe and clearly defined, ordinary creditors would benefit, and bankers could afford to make certain concessions, in either rates or terms, that they now withhold. For instance, those who do not now allow substitution of cotton, in discharge of trust undertakings as to proceeds, might then allow it.

The suddenness of the demands upon a merchant's capital, due to the combined effects of Weekly Settlements and Fixed Price Contracts, makes it particularly important to ensure that sale proceeds will always be liquid. If the merchant delivers unpledged cotton to a buyer, the sale proceeds are tied up until actually paid,

because the bank will not treat them as security against an advance. The reason of this is that, in order to give the banker a good title to collect the proceeds direct from the spinner, in the event of the merchant's failure, the cotton must have been held by the banker and released by him to fill the particular sale.

A case of the same kind, but more difficult to guard against, may occur when a merchant has not enough of a particular quality in Liverpool to fill his immediate commitments. He buys, on ex-quay terms, say, 500 bales now landing. When only 200 bales have been housed, motors from spinners arrive at his warehouse without previous warning, and the cotton has to be delivered to them immediately; there is no time to obtain a warehouse receipt which could be pledged to the bank. The merchant is due to pay his seller on the 16th of the month, but his buyers are not due to pay him until the 22nd. He hands to his bank by the 22nd a warehouse receipt for the 300 bales not delivered, and obtains a loan thereon, but he cannot obtain a loan on the proceeds of the 200 bales delivered, for the bank never held them. He would have avoided the difficulty if, when he got the order from his seller for 500 bales, he had pledged it to the bankers, who would then have handed it to a warehouse-keeper with instructions to take delivery and warehouse the cotton in their name. Of course, if he did this, the merchant should draw the bank's attention to the fact that he had not yet paid for the cotton. This might not affect the bank's rights over the cotton, but it would at least prevent the bank, and himself, from jumping to any wrong conclusion as to his immediate financial position.

Another way in which assets get tied up is this. The merchant has free funds at his disposal, perhaps owing to a rise in market when he has fixed price sales open, and

he utilizes these funds to pay off a loan which is partly secured by outstanding sale proceeds. Before the sale proceeds come in he requires the money, and he then finds that they are not available as security, because by making payment to the bank ostensibly in discharge of a trust undertaking, he has discharged the bank's claim against his undertaking. A similar thing may happen even if he pays off a loan against cotton and then has to get the cotton released to a buyer before there is time to repledge it. Under these circumstances, bankers sometimes (and it may be always) refuse to treat such proceeds as security for a loan, on the ground that there is no specific loan open against the cotton at time of release, and that this fact prevents their having a good title to the proceeds.

Where surplus funds are paid against loans, the difficulty can easily be avoided. The merchant should arrange with his bank that all repayments, other than those in discharge of trust undertakings as to proceeds or those required because of a fall in value of the security, shall be credited to a special account which shall bear interest at loan rate. The amount at the credit of this account will be absolutely liquid.

To understand the handling of cotton finance, some knowledge of the Cotton Bank is necessary. The Cotton Bank is not a bank in the ordinary sense. It has no depositors and gives no financial accommodation. Each morning it receives payments from banks in the spinning districts and from Liverpool cotton firms; it credits these payments, in accordance with the instructions that accompany them, to various cotton firms, to whom it gives credit certificates. These certificates are presented by the firms named therein to the Clearing House of the Liverpool Cotton Association, together with a statement ("23" form) of "vouchers," i.e.

credit transfers, that they have issued to other firms and of vouchers that other firms have issued to them. There is never a debit balance on these statements, because each firm who would have a debit balance pays in to the Cotton Bank, and obtains a certificate for, whatever amount is necessary to square its own statement. At the time of clearing, the Cotton Clearing House send to the Cotton Bank a list of the firms who have credits on their statements and of the respective amounts. These credit balances are not drawn out by cheque or left in the Cotton Bank overnight, but are paid to each firm's bank for the credit of the firm. The Cotton Bank is used chiefly for payments of invoices for actual cotton, payments for claims of various kinds, and payments for weekly settlement differences against futures. The turnover of the bank during the boom period of 1919-20 averaged about £1,000,000 a day.

The present method of dealing with weekly settlements seems to be capable of improvement. Each firm renders every week to every firm with whom it has futures open or with whom it has transacted business during the week, a statement showing the amount of cash due to or from them in the settlement, and the bales open in each position at the end of the week. This involves a huge amount of clerical work, for many firms have to make out 150 or more settlement statements each week. The congestion of work leads to frequent errors, indeed, about 20 per cent of the statements rendered are wrong and have to be corrected afterwards. In addition to these statements it is usual for each firm to make up an "estimate" of the amount it has to pay or receive on each position as a whole. In the estimate only one interest calculation is needed for each position, and the results of the various positions collectively, after allowing for interest, differ only by a few shillings from the

balance of cash that actually passes. Why should not firms pass, between themselves, merely statements of the balance of bales open in each position, and send to the Clearing House copies of their estimates? In case the total liabilities, excluding interest, of the firms due to pay in the settlement did not agree with the total amounts, excluding interest, claimed by those due to receive, the error could be easily located to one month, since the balance payable or receivable for each position would be shown by each firm. In that case a notice on the board in the Exchange, on Tuesday morning, would inform all firms interested in, say, July that they must send to the Clearing House a detailed statement of the individual differences that they ought to pay to or receive from other firms against July contracts. The method would be similar to that already in use when errors occur in "23" forms, and the present system of fines for errors should ensure accuracy. Economies amounting to many thousands a year would result if the scheme could be worked.

The growth of motor transport necessitates much quicker release of cotton by banks than formerly. In order to avoid loss of time in providing the warehouse-keeper with specific releases before delivery, some firms get their bankers to authorize the warehouse-keepers to deliver a certain limited number of bales in anticipation of specific releases. Sometimes, by arrangement with the merchant, the warehouse-keeper gives a standing undertaking to hold at the disposal of the banker, whenever cotton is delivered in anticipation of release, a corresponding number of bales out of the various little lots lying in the merchant's own name.

One case in which there is reason to think that bankers' security is sometimes impaired, arises from carelessness and lack of thought. Sale proceeds for cotton pledged

to a banker are due, in equal amounts, on the 3rd, 6th, and 9th instant from different buyers. That due on the 9th is paid on the 2nd, and the merchant substitutes fresh cotton against the release for which proceeds are due to him on the 3rd. This saves the merchant some inconvenience if the proceeds due on the 3rd are not paid when due, but it wipes out the banker's claim to those proceeds; and as the proceeds due on the 9th have already been received by the merchant, the banker's security is henceforward only the proceeds due on the 6th. The banker is led to suppose that his security consists of two sets of proceeds still outstanding, whereas it consists of only one. Careful co-operation between the cashier and the man who attends to substitution is necessary in order to avoid this irregularity. If the proceeds due on the 3rd do not come in by that date, the proper procedure is to advise the banker of the fact, not to say nothing; bankers usually make things easy in such cases so long as their customer puts the facts before them.

There is generally an implied, if not a written, undertaking that the merchant hedges all the cotton he pledges to the banker. Strictly carried out, this would mean that no merchant could speculate on the long side to a greater extent than the amount of cotton lying in his own name. Probably few merchants realize this, but most bankers do. Although "futures" would be virtually impossible without speculation, and although speculation within the trade may be preferable to speculation from without, yet when bankers have to decide the amount of credit to be allowed to any particular firm, they can hardly help considering how strictly the firm interprets the implied undertaking in regard to hedges.

The most important thing in dealing with a banker

is to create confidence. This is a slow business, and can only be done in one way ; you have to earn his confidence. Always point out to him fully and frankly every risk in the transactions you put before him, and give him as much information as possible about your business in general ; especially let him have detailed audited balance sheets. If something happens that you have not warned him about, he will remember it against you ; but if you have warned him he will not greatly mind. If you warn him of some possibility that does not happen, he will realize that you fully estimate the risks of your business ; and when you ask later for special concessions, he will stretch a point in your favour if he can. You can tame even the fiercest bankers by prudence and frankness.

Lecturers—B. H. Hird, B.A., Percy White, A. Bryce Muir, T. G. G. Powell, John A. Todd.

References

Cotton Futures (A. Bryce Muir), *Daily Post* Printers, Liverpool.

Cotton and the Cotton Market (Hubbard), Appleton.

Handbook of the Cotton Trade (Ellison), 1858.

The Cotton Trade of Great Britain (Ellison), 1886.

CHAPTER III

THE LANCASHIRE COTTON INDUSTRY

SPINNING

THE beginning of the textile industry takes us back to the childhood of man when his wants were few in number and simple in character, and spinning as a handicraft has been carried on from remote ages. The spinning and weaving of goats' hair and flax are mentioned in the book of Exodus, but these processes had been carried on long before this period. By what means they were performed historians are not too clear; probably by two persons, the resultant twine being wound on a twig, for it must have been known for ages that twisting would bind fibres together, and thus enable a long thread to be made from comparatively short fibres. This binding together of fibres by twist is the basis of spinning, and consequently the physical structure of a fibre controls, to a very large extent, the ease with which this twisting together can be performed. Hence, of the many thousands of fibres that are found in nature some are more suitable for spinning than others.

Textile fibres are found in the mineral, animal, and vegetable kingdoms. The first is chiefly represented by asbestos, the second by silk, wool, and various hairs of mammals, the third by flax, hemp, jute, manilla, coir, and cotton. The chief requirements for textile purposes are that the fibres possess tensile strength, and either length or natural clinging powers that will enable them to be bound together by twist. Tensile strength and natural cohesion are present in wool and cotton to a high degree.

Up to 200 years ago very simple methods were employed to twist textile fibres together, as represented by the spindle and distaff, the Saxony wheel, and the spinning wheel ; and even before this time it had been found that by previous cleaning and carding of the raw materials greater efficiency in quality and quantity could be secured. Most of the early spinning of yarn was from wool, flax, or similar long fibrous material, but there is evidence to suggest that very simple processes were employed for the spinning of cotton in India before 1000 B.C. During the last two centuries, however, rapid strides have been made in adapting mechanical means for performing these simple spinning processes, so that what the spinner once performed he now only directs, and the cotton spinner has led the van in this modern development.

The principles underlying the twisting of a yarn from raw cotton are really very simple, and remain fundamentally what they were in the beginning, and a knowledge of the modern spinning process requires the study of machines for automatically performing these simple actions rather than of the principles themselves. It is essential, however, that the simple principles of spinning should be clearly understood, and especially so by those responsible for supplying the raw cotton, for the condition of the raw cotton controls the ease with which modern machinery can be adapted to its work. On examining a bale of raw cotton one finds the fibres matted and entangled, and imprisoned within the mass are certain impurities, such as leaf, broken seed, nep, and short fibre ; and as the mind stretches forward to visualize the final product it will be realized that to secure a clean, strong, and uniform yarn it will be necessary to give the raw cotton the following treatment :

1. *Blending* of lots of cotton to give regularity of quality, colour, and character.
2. *Opening*, to separate the matted fibres.
3. *Cleaning*, to remove the impurities.
4. *Straightening* the fibres to make them parallel before twisting.
5. *Uniforming*, to give regularity of diameter of yarn, i.e. an equal number of fibres in cross section.
6. *Attenuating* or drawing out gradually from a mass of cotton to a fine yarn.
7. *Twisting* together of the clean straight fibres to bind them.

In the modern spinning process the cotton is subjected to these actions by a series of machines, each of which is introduced for a specific purpose, but most of them contribute in a minor degree to some other part of the general treatment. These machines and processes may be tabulated as follows—

PROCESS NO. 1. BALE BREAKING. (Treatment
No. 2)

When cotton is removed from the bale it is in hard, matted cakes that are caused by the heavy pressures used in baling, and before mixing and cleaning processes can begin it is necessary to loosen the cotton from this highly compressed state. The machine used for this purpose is known as the Hopper Bale Opener, and subjects the cotton to a rough combing action. An endless lattice carrying strong steel spikes is designed to rotate within a hopper box, and the spikes take hold of lumps of matted cotton and carry them upward until they are arrested by a spiked roller revolving in the opposite direction, and set a definite distance from the lattice spikes. Pieces of cotton larger than the distance between the lattice and roller spikes are knocked back

into the hopper and this continues until the flakes of cotton are small enough to pass forward. The raw material in this open flake form is then carried automatically to the mixing process.

PROCESS No. 2. MIXING. (Treatment No. 1)

The object of this process is to average variations in colour, length, grade, and character of staple that exist even in the same lot of cotton, but more particularly in different qualities and growths. It is not uncommon for spinners to mix quite different styles of cotton to get a particular type of yarn, but even where only one growth of cotton is used mixing is practised to get uniformity of quality.

The loose cotton from the Bale Opener is spread in horizontal layers in open stacks, one bale on the top of another, and after standing in this open condition for a few days it is removed from the side of the stack in vertical slices.

The distribution of the cotton from the Bale Opener to the stacks is performed by an arrangement of endless lattices or by a more recent arrangement of pneumatic trunks, which help to condition the cotton and remove liberated dust. Many spinners of American cotton discard the "Stack," and mix the material by opening a number of bales round the Bale Opener, and feeding the cotton from these bales in sequence. For fine spinning and where different growths are used together it is the usual practice to have a stack mixing and blend fifteen to fifty bales at one time.

PROCESS No. 3. OPENING. (Treatment Nos. 2, 3, and 5)

From the mixing stack the cotton is passed forward to the opening process, where the real treatment of separating the fibres and extracting the impurities

commences. Opening machines not only clean and open the cotton, but also collect it into a uniform sheet convenient to be handled in the subsequent processes.

The cotton is usually fed to the opener by an automatic hopper feeder, similar in construction to the Hopper Bale Opener, but the object of the feeder is to give a uniform supply of material to the lattices that feed the opener beaters. These are large cylinders covered with coarse combing spikes, which operate in a box partially surrounded by a specially constructed grid. As the cotton is fed into the beater box it receives a rough combing and is dashed against the grid bars, and much of the broken seed, leaf, and sand liberated by opening the cotton escapes through the grid, and thus is separated from the good cotton. The opened fibres are removed from the beater box by an air current, and collected by this means on to a revolving cage, which delivers the material to a lap machine, where it is pressed by rollers and delivered in a sheet, 37 to 45 in. in width, and rolled into a compact "lap."

PROCESS NO. 4. SCUTCHING. (Treatment Nos. 2, 3, and 5)

Scutching is a continuation of the opening process, but in the scutcher the cotton is subjected to a batting action in the beater box instead of a rough cylindrical comb treatment. Steel bars are carried round 1,200 times per minute within a beater box, and detach the cotton from the feed rollers and dash the fibres against grid bars similar to the opener. The bladed beater is a more effective cleaner than the comb beater, but the cotton must be fairly well open before this treatment is given.

Both openers and scutchers are provided with special automatic mechanism to feed a definite weight per yard into the beater box, so that the resultant sheet of cotton

delivered is fairly uniform in density throughout its length, and weighs about 12 oz. per yard. In the same manner as the opener the sheet from the scutcher is rolled into a compact lap, which is automatically measured.

PROCESS No. 5. CARDING. (Treatment Nos. 2, 3, and 6)

This process is the most important one in the whole of the preparation of cotton for spinning, because its primary object is to complete the separation of the cotton fibres which has been only partially accomplished by opening and scutching. A large revolving cylinder covered with needle pointed teeth, numbering about 400 per square inch, and inclined in the same direction in which the cylinder revolves, is fed with a thin film of cotton from the "lap" sheet. In its revolution the cylinder carries the matted fibres to another set of teeth similar to its own, but inclined in the opposite direction, and almost stationary. The distance between the opposing combs is generally $\frac{1}{100}$ th of an inch, so that entangled groups of fibres are arrested until they are combed apart sufficiently to pass forward with the cylinder teeth. About one-third of the area of the cylinder is surrounded by these opposing teeth or "flats," and when the cotton emerges the fibres should be thoroughly separated one from the other.

The machine used for this operation is still known as the Carding Engine, and in addition to separating the fibres it extracts much of the finer impurities, and also reduces the lap, which weighs about 12 oz. per yard, to a "sliver" or strand of cotton weighing approximately 50 grains per yard, and three-quarters of an inch in diameter. This sliver is the first beginning of a yarn, and is a group of clean separated fibres, held together by their natural cohesion. The "sliver" is coiled into

a can 9 in. \times 36 in. deep, and is in a convenient form for passing forward to the next process.

PROCESS NO. 6. DRAWING. (Treatment Nos. 4, 5, and 6)

Unfortunately the sliver as delivered from the card is very irregular in weight throughout its length, and the fibres in the strand are badly crossed with each other, and it is to overcome these defects that the *Drawing* process is introduced. The machine known as a draw frame consists of four pairs of rollers, $1\frac{1}{2}$ in. in diameter, and between these the card sliver passes. Each succeeding pair of rollers the cotton meets has a higher surface speed, with the result that the last pair is generally running six times faster than the first pair, and as the sliver passes forward it is attenuated or drawn out. Generally, six card slivers are fed together, and consequently the delivered strand is the same weight as one of the slivers fed to the machine. This folding together and drawing out, while not eliminating the defects of varying slivers, averages the differences, and gives a more uniform strand. The folding and attenuating is repeated two, three, or four times, and the machines are provided with detector mechanism to stop the machine when a sliver fails to pass forward.

The continued drawing of fibres one over the other while attenuating the slivers, causes the fibres to take up a position parallel to each other, and this arrangement is necessary before the fibres are twisted together if we are to obtain the most efficient yarn.

PROCESS NO. 7. FLY FRAME. (Treatment Nos. 6, 7, and 5)

The sliver as delivered from the draw frame consists of a rope of cotton fibres that have been cleaned, separated,

strengthened, and made parallel, and varying very little in weight along its length. The object of the Fly Frame process is to reduce this sliver gradually to a fine "rove" weighing $\frac{1}{2}$ to 2 grains per yard, ready for the final spinning machine. The drawing-out, or real attenuation of the strand, is performed by three pairs of draw rollers, but unfortunately with the present design the sliver cannot be reduced from 50 grains to one grain per yard by a single drafting. Consequently, a series of fly frames is used, usually three in number, and named Slubber, Intermediate, and Roving Frames. The first named is fed with the draw frame sliver, and the Roving Frame delivers a "rove" ready for the spinning frame. During the operation the strand has become too thin to hold together by the natural cohesion of the fibre, so that a few turns of twist are inserted at each machine to hold it together, but never sufficient to prevent the fibres drawing over each other in the subsequent drafting. The softly twisted "rove" is then wound on a wooden bobbin, of convenient size, by special mechanism.

PROCESS NO. 8. SPINNING. (Treatment Nos. 6 and 7)

There are two types of machines used for the completing process of spinning, namely, the Mule and the Ring Frame. Both these machines give the final attenuation from the roving to the required fineness, or count of yarn, by three lines of drawing rollers in exactly the same manner as the draw frames and fly frames. When the groups of fibres are delivered from the spinning frame draw rollers they are sufficiently thin to be bound together by twist to form a continuous thread, and this is given by spindles revolving, or "spinning," at a speed of about 9,000 revolutions per minute. It is from the "spinning" spindles that we obtain the term "spinning" for making a thread, and it is in the manner

the twist is given and the spun yarn wound on the revolving spindle that the Ring Frame and the Mule differ. In the Ring Frame the yarn in its passage from the drawing rollers to the twisting spindle is passed through a small guide or "traveller," which is loosely attached to a highly polished ring. Revolving at a high speed in the centre of this ring is a spindle on which is fixed a bobbin, and to this latter the yarn is attached. The rotating bobbin carries round the yarn which in turn drags with it the traveller on the polished ring, and in this way one turn is inserted into the yarn for each revolution of the traveller. As the strand of cotton is delivered from the drawing rollers it allows the traveller to lag behind the revolutions of the bobbin, and this action causes the spun yarn to be wound on the bobbin at the same time that twist is being given. A suitable vertical movement given to the ring rail builds up the yarn on the bobbin in such a form that it can be unwound without entanglement. A ring frame contains from 300 to 400 spindles, which are all twisting at the same time, and an operative will attend to two frames or up to 800 spindles in comparison with one spindle operated by the spinster two centuries ago.

The Mule spinning frame also attenuates the roving by drawing rollers, but the "twist" is inserted in the same manner as was done by the old hand spinning wheel, where the yarn was held at an angle to the spinning spindle. The yarn winds up the spindle until it reaches the point, and then slips over, and each time it does so one turn, or twist, is given to the thread. As the revolving spindles are imparting twist to the drawn strand they are caused to move bodily away from the drawing rollers until they have produced a "stretch," or length of yarn, about 60 in., when the operations of drawing and twisting cease, and the length of spun thread is

wound automatically on the spindle in the form of a cop. It will be seen that Mule spinning is an intermittent operation, and consequently does not produce as rapidly as the ring frame, which is a continuous spinner. Ring spinning, however, has limitations as to the fineness and softness of the yarns it can spin. A Mule frame generally has about 1,000 spindles operating simultaneously, and a "minder" with two assistants attends to two machines.

When fine, or high counts¹ of yarns are to be spun, certain modifications are necessary in the spinning process to meet the more exacting requirements from the raw material, and, furthermore, as it is necessary to use longer stapled cotton, certain alterations are needed in the opening, cleaning, and attenuating operations to deal with these cottons. It will readily be understood that it is more difficult to remove impurities from long fibred cotton due to their liability to entanglement, but even so, greater care must be taken during their treatment, because of the more delicate nature of the fibre compared with short stapled cottons. Frequently the scutching machine is omitted, and the extra opening is secured by an extension of the coarse combing treatment given in the opener process, and in addition, this latter operation is performed at much slower speeds and with greater care. Lower production and greater efficiency are also demanded from the carding process. To secure the extra attenuation necessary to produce a finer roving for the final spinning frame, a fourth machine known as the "Jack Frame," is often used in this series of machines, and the drawing rollers are specially constructed to meet the wider variation in the length of fibre that is always present with long-stapled cottons.

¹ The "count" of cotton yarns is the number of hanks of 840 yds. length which weigh 1 lb. avoirdupois.

Although during recent years many fine yarns have been successfully spun on the ring frame, better results can be obtained from long fibres by spinning on the mule system, and consequently by far the greater proportion of fine yarns is produced by the latter method.

COMBING (Process No. 5a)

The greatest difference in the production of fine yarns, however, is due to the introduction of the combing process between the card and draw frame.

All long staple cottons contain a fair proportion of short fibres, which reduce the average value of the material for spinning purposes, and it is to extract this short material that the combing process is introduced. Eighteen card slivers are run together to form a narrow or ribbon lap that is afterwards passed through one drawing process similar to the draw-frame treatment, but for this purpose the machine is constructed to deal with ribbon laps instead of slivers. The object of the process is to straighten the fibres prior to the real combing treatment, and thereby improve the efficiency.

In the comber the ribbon lap is subjected to an interesting treatment by nippers, combs, and rollers, in such a manner that before the combed fibres can pass forward they must be long enough to bridge a set distance between the nippers and rollers or they will be extracted as waste. It will thus be seen that the object of the combing process is to extract from the material all fibres that are below a certain length, and consequently the delivered material is greatly improved in spinning qualities, not only because the average length of staple is increased, but also due to the short immature fibres, nep, and fine impurities being removed. The process extracts from 20 to 30 per cent of the cotton delivered

from the card, and consequently adds greatly to the cost of the subsequent yarn ; but for high-class and fine count yarns it is essential unless exceptional cotton can be obtained. From the finest growth of Egyptian it is possible by combing them two or three times to spin yarns as fine as 300s. and from special growths of Sea Islands to 420s. These very fine yarns, however, are rarely needed, and the great bulk of fine combed yarns range between 80s. and 200s.

DOUBLING

In almost all the operations of cotton spinning, some combination or mixing of raw cotton, sliver, or roving takes place with the object of obtaining uniformity, but the term "doubling" is applied more strictly to the twisting together of spun cotton yarns or of cotton yarns with yarns spun from some other material. Such combinations provide a wide field for the exercise of ingenuity, and the doubler has a bigger scope with his materials than the spinner.

Strength, smoothness, and novelty of appearance are obtained by variations in process, and the doubler must always be ready to meet changing requirements and conditions. Strong yarns are required for the warp of many fabrics, the weft of which is of a softer or more pliable nature. The extra strength given to single yarns by doubling with the correct amount of twist without unduly increasing the thickness or diameter, brings doubled yarn into common use for the warp of Italians, alpaca, lenos, fustians, etc.

In many cases, especially in fancy cloths, the weft may be wool, silk, artificial silk, etc., but in other cloths the weft also will consist of cotton of the same or possibly of a different character to the warp yarn.

Strength is naturally the chief requisite of sewing, netting, twine, and heald yarns, whilst tyre fabrics, lace, embroidery, and crochet yarns must have a greater strength than a single yarn of the same thickness could possibly give.

Smoothness and compactness are necessary to many of the above, more particularly to sewing threads and warp yarns, to which end the doubler applies processes other than the actual twisting to eliminate faults found even in the highest class singles, such as piecings, slubs, soft unspun places, specks of immature cotton, etc. Such faults are removed by the doubler as against the covering of them by external aids, such as polishing and sizing.

Novelty of construction will be welcomed as long as fashions change. Combinations of thick with thin yarns, tight with slack yarns, plain with coloured yarns, or cotton with silk, wool, and other materials, are familiar to all wearers of clothing and users of tapestry and upholstery.

It would not be useful to detail exactly the manner in which yarns are manipulated before leaving the doubling shed as, unlike the spinner, the doubler is frequently a law unto himself, and obtains the same result as his fellow doubler by varying methods. The various operations are found, however, in almost all doubling mills, though many will have special machinery to deal with fine as against coarse yarns, sewing threads and hard yarns as against soft yarns for mercerizing and embroideries.

Doubling and Twisting machines are of three types, each of them evolved from similar machines used in the spinning trade.

“Flyer doubling” and “Ring doubling” machines work by means of a continuous operation, whilst

“Twiner doubling” machines work by intermittent movements, the yarn on the latter being delivered and twisted by one set of movements, and formed into a cop by a further set. The mechanism of the twiner is an adaptation of the spinning mule.

Twiner doubling is somewhat limited in its scope, and is not able to impart the same regularity of twist as its rivals. It is considered, however, to be the cheaper system, and is in vogue for many classes of yarn which do not require the exactitude that can be obtained by the Flyer and Ring frames. It was originally introduced in the Yorkshire textile area, and has found its way into the Lancashire and Cheshire cotton towns on the Yorkshire border, but its use is gradually declining.

The Flyer Frame, as its name implies, makes use of a flyer mounted on a spindle, which also carries the bobbin of twisted yarn in a somewhat similar manner to the flyer frame used in the spinning mill. Twist is obtained by the ratio of speed of the flyer, spindle and delivery of yarn from the roller.

The Flyer frame is superior to the Ring frame for regularity of twist and its capability of producing a compact thread, but except for special purposes it is superseded by the Ring Doubling frame, which gives a much greater production.

The Ring Doubling Frame imparts twist to the yarn by means of a “traveller” moving loosely round the ring, and pulled round the rim by the yarn in its passage to the spindle. The rate of delivery of yarn from the rollers, the weight of the traveller, and the speed of the spindle are responsible for the turns per inch put into the yarn in the same manner as in Ring spinning. There is no drawing or attenuation of the yarn in doubling, one line of rollers only being used.

Yarn is received from the spinner in the form of a cop or on a ring bobbin, and is wound on a tube of wood or paper or a wooden double-flanged bobbin. It may be wound with a single end or with two, three, or more ends together, a stop motion being fitted to the machine which stops only the bobbin on which an end has broken. The more obvious spinning faults are taken out of the yarn at this machine by means of a "snick" or nicked plate, which prevents the passage of thick lengths of yarn.

The wound yarn is taken to the creel of the doubling frame to be twisted into two or more fold as required.

After twisting, the yarn is again wound on bobbins, the contents of several of the small doubling bobbins being assembled in a continuous length on a much larger bobbin. The important operation of *clearing* takes place at this stage. An adjustable clearer plate is fixed on the machine between the doubler bobbin and the bobbin to contain the wound yarn. The nicks or slits in this plate are regulated to suit the counts and diameter of the yarn, and after being correctly set the plates are locked. The operation is simple, but of extreme importance, faults such as soft places, large knots, bad piecings, etc., being removed. Those faults, such as black or oily places, which the plate cannot stop, can be observed and removed by a good worker, so that in this process the human element may count for more than mechanical efficiency.

From the clearer winding frame the yarn may return to the doubling room to be again twisted into four, six, or nine cords, as such threads are not twisted at one throw or operation, but are combined from two or three fold by a second twisting.

The yarn may also require to be *gassed* after clearing. This process is applied specially to yarns for mercerizing,

in order to give them additional lustre, and to other yarns to give increased smoothness. The yarn is passed through a flame which removes the projecting fibres. Naturally the yarn is made a little finer and a little darker. It also gains a little in strength. Several types of machine are in use, including a machine which singes by means of an electric flame. The usual method, however, is to singe by means of coal gas mixed with air and passed through a specially adapted burner. In districts where coal gas is not easily obtainable, extremely satisfactory results are obtained by petrol gas. Gassing rooms for many years were most undesirable places, but to-day they are rendered clean and healthy by means of trunks and fans, which introduce fresh air and draw off the burned fibres, fumes, and hot air, without allowing them to affect the atmosphere of the room.

The final processes of the doubling mill are for the purpose of presenting the yarn in the most suitable form to the user. The yarn may be wound on to paper tubes of different sizes for export in cases, or *reeled* into measured lengths for the dyer, polisher, bleacher, etc., and pressed into compact bundles for ease in transit. The lace manufacturer will have his yarn "prepared" with a little grease, and passed through weighted calender rollers before bundling, whilst the cloth manufacturer will take the yarn for the warp of his cloth on a beam and on a pirn-tube to suit the shuttle for his weft.

Whatever the purpose for which the yarn is intended the doubler must regulate his operations accordingly from the commencement, arranging the type of single yarn which he must use, and varying his subsequent processes to suit exactly the appearance, feel, strength, or novel effect which is required.

WEAVING

It is important that the manufacturer should receive his raw material, viz., yarn, in a suitable condition for conversion into a woven fabric. The degree of cleanliness and regularity of the yarn constitutes to some extent its quality, and, of course, largely governs the price. In most fabrics it is of vital importance that the yarns should be clean, regular, and lustrous. The manufacturer has to search the market for spinners capable of supplying his needs who can be relied upon to produce a regular unvarying yarn. The manufacturer may buy his yarn in a large number of forms, and he will select those which are most convenient to handle by the plant in his mill, or if a spinner has a reputation for preparing the yarn in a convenient form, the manufacturer may select that.

During recent years spinners have increased the variety of forms in which they sell their yarns, and this has been a great convenience both to themselves and to the manufacturers. Yarn may be bought in cop, twist and weft, ring spool, hank, cheese, and ball, chain, or beam warp.

The preparation of yarn for the loom varies considerably with the kind of cloth to be made, the two principal divisions being grey and coloured, grey meaning cloth woven in the natural colour of the cotton, and coloured including white as well as colours, that is, yarn which has been treated to alter its colour.

The Warp. Assuming yarn is bought in the form of cops or bobbins, it has first to be wound into long continuous lengths as a preliminary to the formation of a warp which forms the longitudinal threads of a piece of cloth. Warping means the assembling of threads in sufficient numbers, count, quality, and colour, and of a suitable length for the cloth to be woven. There are many ways of doing this, but in the case of grey cloth the most common form is by beam warping, which is

the most efficient and economical for the production of large quantities of cloth of a similar character, such as the ordinary run of plains, twills, satins, and fabrics of that type. The threads from the bobbins are collected and assembled on a large beam. These beams commonly hold upwards of 460 threads 20,000 yards long, approximately 400 lb. of yarn on each beam.

Sizing consists in treating the threads with a boiling solution containing starch, water, and some lubricating agent. The object is to lay the outstanding cotton fibres so that they may pass through the strain and friction entailed in weaving without breaking down. The process includes the winding of the sized threads to the weaver's beam. Owing to the fact that in some classes of cotton cloth the yarn is loaded with very large quantities of size, as high as 100 per cent and over, sizing is associated by some people with fraud and adulteration, but all single threads must be sized for the reasons given, and in the case of heavy sizing it is merely a question of meeting a market which has been in existence since the days of the Cotton Famine. Sizing has a very important effect upon the yarn, and it is possible to nurse inferior yarn into cloth by careful and judicious sizing, whilst on the other hand, high class yarn may be rendered almost unweavable by careless sizing.

The preparation of coloured threads differs in many ways from the treatment required for grey yarns, but the object is practically the same, namely, to place the threads in suitable condition for weaving.

When the warp threads have been placed on the beam in a straight and compact position so that they can be withdrawn under proper and equal tension, they are ready for the next preliminary operation known as "drawing in," or some analogous process. This is to place the threads in such a manner that they can be

manipulated in a vertical direction to permit of a suitable method of interlacing with the weft threads.

The Weft represents the threads which are placed across the warp threads and interlaced with them in any suitable manner. Their preparation is usually of a very simple character, and in the case of most grey cloths the yarn is used in the state in which it leaves the spinner, namely, the cop or bobbin. Sometimes the yarn is re-wound for reasons of economy and quality, and it may also require to be bleached, dyed, or mercerized for special purposes.

The general principles of weaving involve three principal and a number of auxiliary motions. The principal motions are known as "shedding," "picking," and "beating up." These motions are practically as old as weaving, and weaving by power has very largely consisted of applying power to reproduce the motions formerly performed by hand. There have been many attempts to introduce new principles, but these have not met with success. It is because of these intermittent movements that weaving is being threatened with other methods of fabric production, such as knitting, in which the motions of production are continuous instead of intermittent. Shedding means the separation of the warp threads into upper and lower planes between which the thread of weft contained in a shuttle is passed, the latter operation being called picking. When the thread or weft (a "pick") has been laid in position it is pressed forward sharply by means of a reed, and this final operation is known as beating up. The means employed for separating the warp threads vary according to the kind of interlacing desired; for plain cloths two healds are used, each containing one-half of the warp threads, and as these are raised and lowered alternately so the plain cloth division is obtained.

The auxiliary motions of a plain loom are two in number. As the weaving proceeds it is necessary to provide means by which the cloth is drawn forward at a regular rate. This is known as the "taking up" motion, and it is by a careful manipulation of the mechanism that fabrics of varying qualities are produced; thus for light qualities the cloth is drawn away at a quicker rate than if the quality is heavy and close. The closeness of the threads in the warp is determined by the reed, thus, if the threads are drawn in a reed whose dents are set close together, one gets a fine close cloth, whereas a coarser reed makes a more open or coarser cloth.

Connected with the control of the onward movement of the cloth is the control of the warp, and this is known as "letting off." This is a device of weighting or tensioning the warp so that the picks may be put in under conditions suited to the kind of cloth being made. In light textures only enough tension is required to keep the warp straight, but as the cloth increases in closeness of picks or closeness of weave, more tension is required so that the warp will stand up to the blow of the reed necessary to drive in the picks. In some textures the number of picks may be as low as 40 to 60 to the inch; in closer heavier fabrics they go on increasing to 80, 100, 150, and 200, until in velveteens the number may reach 600 or 700 picks to the inch, and to get these in, the warp has to be held rigid and the picks slide along and practically pile one upon another.

Besides the simple fabrics referred to there are many which come under the general description of fancies. These require certain additions to the loom, and also considerable care in the selection of materials suitable for the fabrics to be made. For large patterns more healds and a large pick control are required, the latter being obtained by using a dobby, and when more than

about 20 healds are required it is wise to use a Jacquard machine. It is a simple piece of mechanism, and has an almost unlimited scope for pattern production.

One of the great troubles in making figured designs is the tendency of customers to ask for larger patterns, and the weakness of salesmen (particularly in distant countries) in acceding to these requests, without thoroughly appreciating the cost involved. This demand for an increase in the size of pattern has led to the introduction of other machines with larger scope, and some very ingenious devices are used. In some fabrics of the table cover type there is being introduced an electrical device which dispenses with the Jacquard and cards, and which utilizes an insulated plate acting on fine needles to produce the pattern in the cloth. This is a considerable advance, and is being eagerly looked forward to by manufacturers of this type of cloth.

BLEACHING, DYEING, AND CALICO PRINTING

The impulse to use colour and design for the decoration of the person and the home appears to be instinctive in man. The remains of the most ancient civilizations and the customs of the most primitive existing peoples equally exhibit the inherent appreciation of beauty of form and colour. It is practically impossible to say where the art of dyeing and printing textiles first began, but the inspiration of the modern European industry came from India via the Nearer East.

The rotary printing machine was invented in 1783, and modern methods of bleaching, dyeing, and calico printing date from the general adoption of this machine by the industry between 1840 and 1870. Methods of grass bleaching, which required anything from six weeks to six months for the production of a good white, served so long as the handblock remained the only method for

the application of the printing colour, but with the increased production possible with the rotary printing machine, all printworks processes had to be correspondingly speeded up.

A modern calico printworks is really a collection of various industries under one control. An up-to-date works must possess, in addition to the departments actually handling the cloth, an efficient mechanical department, including engineers, joiners, turners, coppersmiths, blacksmiths, and masons.

Not the least important part of the work is the raising of steam and its utilization for boiling, and for drying, as well as for power.

Cloth arriving at a printworks is taken to the "grey room," where it is examined to ascertain that it agrees with the advised particulars. An identification mark is stamped on it, usually with prepared tar, and the pieces are sewn end to end for running through the singeing machine.

The object of singeing is to remove the nap from the cloth, so that a perfectly smooth surface may be obtained for printing.

The actual operation of singeing is carried out either by passing the cloth over red hot copper plates, or by passing it over a gas flame. Sparks are quenched by passing the goods through water, and the wet goods are then piled down for from twelve to twenty-four hours. In many works either mineral acid or a starch-destroying ferment is added to the grey steep water.

Bleaching. The aim of the bleacher is to obtain as nearly as possible pure cellulose, freed alike from the natural impurities of cotton and the sizing materials added by the weaver. The cloth is washed out of the grey steep, and in the case of a full printers' bleach, boiled in a "kier" under pressure with milk of lime.

The cloth is washed out of the lime kier, treated with weak mineral acid, and rewashed into another kier, where it is again boiled under pressure with caustic soda. From the caustic kier the cloth is washed, passed through weak bleaching powder solution, washed, treated with weak acid, washed, squeezed, and dried. For many purposes a single boil bleach is sufficient, and in such cases the lime boil is omitted.

Colour Mixing. Dyestuffs as marketed are not in a condition for direct application to the cloth. In the colour shop the dyes are prepared for the machine. The requisite amounts of the various dyes are here brought into solution, mixed with a suitable thickening agent, and a suitable mordant or other fixing agent added.

The principal thickeners used are starch, British gum, certain natural gums, tragacanth, Irish moss, and the ground kernels of the locust bean.

Printing. In printing a design on calico each colour in the pattern requires a copper roller, engraved with that portion of the design which requires to be printed in that particular colour.

Engraving for calico printing is carried out chiefly by three methods—(a) Mill engraving for small repeats, (b) Pentagraph engraving for larger repeats, and (c) Hand engraving for large sketches.

The printing machine consists of a large central "bowl," round which is wound the "lapping," to give a cushion for the cloth when pressure is put on the printing rollers. The rollers are mounted round this bowl, and are driven from a large toothed crown wheel placed at the side of the bowl. Each roller is provided with its own colour box, in which a brush or roller revolves, in order to furnish colour regularly to the roller, and with a "doctor," which removes the colour from the smooth surface of the roller, leaving it only on those

parts roughened by the engraving. Each printing machine is also provided with a set of drying cylinders, to dry the colours on the cloth after printing.

Very few colours are fixed properly on the cloth immediately after printing. In most cases some sort of steam treatment is required for their complete development. This is carried out in various types of "ager," which will give a steaming of from half a minute to fifteen minutes, or in the continuous steamer, in which the cloth remains from forty-five to seventy minutes.

After steaming the goods are soaped to remove surface colour, and are then ready for finishing. The finishing processes are designed to straighten the cloth and to give it the requisite handle and smoothness.

Finishing. The principal finishing processes are "back-filling," in which starch and china clay are put on the back of the fabric to give it substance and weight; mangling, which may be resorted to either for weighting or softening; stentering, to give width and straightness; and calendering to give the required surface.

"Mercerization" is in reality a finishing process, although it is usually carried out either in the grey or immediately after bleaching. It consists in treating the cloth with caustic soda of a certain strength in such a way that the shrinkage which would ordinarily result from such treatment is prevented. A fine silky lustre can be got on suitable cloths by this method.

"Schreinerling" is the name applied to the production of a surface of very fine embossed lines on the cloth by means of a hot calender roller. This is also a method of obtaining a high lustre on cotton.

THE YARN MARKET

In attempting any survey of the cotton yarn market as we know it to-day, we must remember how the cotton

industry has developed from very small beginnings. A century or so ago, before steam-power or mechanical appliances were known in connection with the trade, cotton spinning and weaving were carried on largely by peasant-farmers for their own and their immediate neighbours' use. With the advent of steam power and the invention of spinning and weaving machines these peasant-farmers were naturally the first people to become the owners of cotton mills. The mills at first were small in size and the machinery crude, but as time went on the mills became bigger and the machinery better in design. It is interesting to note in passing that the highly-developed machinery in use to-day does not differ largely in principle from that designed nearly a century ago.

The early mill-owners found cotton spinning and weaving a very profitable business, and mills became more numerous, and of greater size. In the first instance spinning, weaving, and other subsequent processes such as dyeing and bleaching were carried on by the same firm in the same factory. To-day we find the trade segregated into several distinct branches, and some of these have become subdivided into one or more distinct sections. Bolton and district to-day embraces nearly the whole of the spinning spindles engaged in producing the finer counts of yarn. Oldham and its neighbourhood houses the great majority of the firms engaged in the production of medium and coarse counts of yarn. Both Bolton and Oldham are almost entirely spinning centres.

Blackburn, Preston, Chorley, and the districts adjacent are largely engaged in weaving cloths made from yarns spun in Bolton and a few of the Oldham mills, whilst Burnley, Darwen, Bury, and Hebden Bridge weave yarns made largely in the Oldham area.

Bleaching and dyeing firms are more scattered, the

reason being that a plentiful supply of good water is necessary for the carrying on of these processes.

In the old days, when the peasant-farmer found himself the owner of a cotton mill, he spun his own yarn to make the cloth. To-day it is the exception for the same firm to be both spinner and weaver. It is the segregation of the trade into separate spinning and weaving sections which has created the yarn market.

Our American friends are fond of talking of "mass production," but there are few better examples of this than that provided by the Lancashire cotton industry. Paradoxical as it may seem, it is cheaper to spin yarn, say in Oldham, and convey it to Burnley to be woven into cloth than it would be to carry on both processes in the same mill. The spinner gets a wider market for his yarn and can specialize on his own section. The weaver has a choice of yarns offered to him and can obtain yarn at the lowest possible price because of competition between spinners. The weaver again can specialize on *his* own particular section with consequent economic advantage.

In the early days of the industry, we find that cotton mills were privately owned. To-day we find that nearly all spinning mills belong to large joint stock companies. The passing of the Limited Liability Acts caused almost a revolution in the spinning section, and since that time private spinners have been a diminishing factor. To build and equip a spinning mill of, say, 90,000 or more spindles requires a large amount of capital and joint stock enterprise is the easiest way of raising it.

Weaving requires much less capital, and can be carried on effectively in much smaller units. In many East Lancashire centres what are known as Room and Power Companies have been formed. They provide buildings and motive power only to small manufacturers, who pay

a rent for the space occupied and motive power used. A man, or a small number of men, can thus raise the smaller amount of capital necessary to run a weaving plant.

The first mill-owners had not a great deal of commercial knowledge, and they generally left the selling of their surplus yarn in the hands of some Manchester agent. There are still a few of the private spinners who market practically all of their yarns in this way. The agent is said to have the "consignment" of the yarn. With the advent of the larger mills, financed by joint stock enterprise, directors of these mills found it desirable to engage salesmen of their own to market their production. Thus we find that the yarn market to-day has the two methods of (a) selling through a yarn agent, and (b) selling direct by means of a salesman to the manufacturer. There is a third method of selling yarn, viz., where a spinner sells to a merchant as a principal, he in his turn selling to the manufacturer.

The profession of yarn agent is so well-established that, despite attempts on the part of many spinners to do without him, there seems little reason to think it will ever become obsolete. The yarn agent occupies in his section very much the same position as the cotton broker in his. His business is to be able to offer to a weaver a choice of suitable yarns at any time. The manufacturer when on the Manchester Exchange is largely occupied in the marketing of his cloth, and it is a great convenience and saving of time to him to have a choice of yarns placed before him by an agent. At the same time the yarn salesman, who is the direct representative of the spinner, if he is worthy of the name, will strive to sell all his production direct to the weaver and so obviate having to pay the agent a commission for so doing. As a matter of general practice it will be

found that a spinner sells his yarn partly through agents and partly direct to the weaver.

The actual procedure on Manchester Exchange in the selling of yarn resolves itself into the weaver at his particular pillar or stand being waited upon by a considerable body of spinners and agents, few of whom (if any) know the price quoted by any one of them for any particular count or class of yarn. In this way the manufacturer can see at a glance which particular yarn is cheapest, and, of course, acts accordingly. From the spinner's standpoint there is room for improvement in this method of marketing yarn.

There is no uniform contract for the sale of yarn, nor is there any universally accepted tribunal for the settlement of disputes which may arise. In selling yarn through an agent the name of the manufacturer is stated on the contract and the agent is allowed 1 per cent commission and $\frac{1}{2}$ per cent more if he guarantees the spinner against loss from bad debts. Yarns sold to a merchant as principal may become a source of irritation to the spinner, as he may find the merchant disposing of part or all of the yarns to the spinner's own customers. This may easily happen if a merchant makes a speculative purchase and on a rising market can undersell the spinner even to his own customers. The merchant being a principal, and not an agent, the spinner cannot justly or legally expect redress.

During recent years a considerable trade has developed in cotton yarns for hosiery purposes. The principal centres for this trade are Leicester, Nottingham, and Derby. The usual method employed in this trade is for the spinner to have a resident agent. Bradford is also a fair market for better quality yarns, which are used along with wool and worsted for dress goods. A number of Lancashire spinners attend the Bradford Exchange

once a week. Belfast is also a market for cotton yarns. Some of this is used for mixing with flax to cheapen pure linen goods. Owing to distance from Lancashire most spinners find it desirable to have their own resident agent there. Glasgow is also a market for cotton yarn; a very considerable trade is done for dyeing, particularly for the Indian and Far Eastern markets.

Holland also buys a great deal of Lancashire yarn, particularly of the commoner qualities. Here again spinners find it necessary to employ the services of a middleman. India imports a large quantity of the finer yarns, and the Indian yarn and cloth contract is a document of the most binding character. Lancashire spinners and weavers in the years gone by have helped very largely to bring this into being. If they could frame one as good for themselves they would do the trade a service.

The U.S.A., in spite of high tariffs, still import a considerable quantity of high-class Bolton yarns, the reason being that, up to the present, they find themselves unable to spin them there.

THE MANCHESTER COTTON EXCHANGE

The Manchester market for cotton goods is the largest concentrated market in the world. It falls short of being an organized commodity market in the ordinary sense, but it is a market in which a manufactured article is dealt in, in a wonderful multiplicity of forms. The Royal Exchange is also a convenient meeting place for a large body of manufacturers and merchants. The result of this daily congregation of sellers and buyers is that a competitive market price can be obtained at any business hour for any product of Lancashire spindles or looms. The seller, i.e. the manufacturer or spinner, is able to keep in touch with the trend of the demand,

and he is therefore able to avoid to a considerable extent the production of those qualities of goods which may not be wanted. Contrast with this the other great industries in which selling prices are fixed for long periods and in which goods can be made for stock when there is no likelihood of any immediate demand. Of course, there are those who would consider that the advantage in the matter of price fixing does not lie with the cotton trade.

The Liverpool market in cotton futures or any of the organized stock exchanges deals in standardized objects and such markets are able to get much nearer to a competitive price by the method of dealing by outcry. In the Manchester market for yarn and cloth, standardization of the commodity is impossible. One spinner's 60's twist can be very different from another's, and the differentiation is still wider when the commodity is a fabric which, although open to a certain definite description, can be made out of many types of raw material and subjected to many different finishing processes. In Manchester, therefore, a buyer selects the firm he buys from, and a seller exercises a similar discretion. Instead of a ring, the Royal Exchange consists of couples or groups of men engaged in private negotiations, and owing to this power of discretion, there is no limit on the membership. For an annual subscription of eight guineas anyone can become a member whatever his calling. There are some 14,000 of them, comprising raw cotton merchants, futures brokers, spinners, manufacturers, bleachers, printers, dyers, finishers, shipping merchants, together with all the various kinds of agents or middlemen who bring them together, and all the traders who supply the subsidiary needs of the trade from leather, oil, chemicals, dyestuffs, and starch, to machinery of all kinds.

The Royal Exchange Company is a proprietary company and not a representative body of the community of members. It provides a suitable meeting place for members, but the number of members is always catching up with the accommodation. There are two large boards on which the fluctuations of raw cotton prices are recorded as quickly as the telewriter and cable service can bring the information.

A good deal of Manchester trade is not done on the Royal Exchange at all. A large portion of the British home trade is done in the warehouses of the buying companies. During the morning it is the habit of salesmen to visit the offices of prospective buyers and often to do business on the spot, while the practice of carrying out negotiations by telephone is increasing. All this business, however, is perceptible on 'Change for it has the Exchange behind it as the means of discerning the market price, while business done off 'Change fills up the order books of manufacturers who might otherwise be anxious sellers.

The first important class of trader is the raw cotton merchant, whether from Manchester or Liverpool. The bulk of the raw cotton business, however, is done in the sample rooms of the merchants. Manchester is making a bid for more of this trade in raw cotton, but it is a hard struggle against the conservatism of the shipping lines and of the spinner.

A spinning concern will keep one or more salesmen permanently established on 'Change. Their function is to keep in close touch with all the manufacturers capable of using the types of yarn spun by the mill. These yarn salesmen generally assemble on 'Change in the course of the morning, but the early attendance is mostly in order to compare notes. The manufacturers' representatives, whom they make a point of seeing every

day, do not generally assemble until the afternoon, and the time of greatest activity is between 2.10 and 3.20 p.m. The manufacturer will, as a rule, have more representatives on 'Change than the spinner. If the concern is of any appreciable size there will be two men located at a fixed spot on the Exchange floor whose function is to calculate rapidly the cost of making any cloth which a buyer may need. A third representative will stand there in order to interview and place covering orders with spinners. In addition there may be one or more salesmen or directors who will roam the floor in search of shippers who have offers to make or orders to place.

A shipping house of moderate size will keep several buyers permanently employed, each one specializing in the purchase of a distinct class of fabric, e.g. a dhootie buyer, a shirting buyer, a print cloth buyer, etc., but the divisions are not always watertight, and as the size of the concern dwindles this division of labour disappears. The shipper will buy goods when he has a definite order from a customer abroad, or he will buy on his own initiative, trusting to sell at a profit through his agency or branch abroad. The first type is known as indent business, the second as consignment business, or in the cotton trade as buying on recommendation, as the shipper will often wait for advice from the overseas representative before operating. The state of the overseas market, the level of prices ruling there, the volume of stocks held, and other considerations are often of greater importance than the opportunity of buying at attractive prices in Manchester. The proportion of indent business to consignment business varies considerably in different markets. Consignment business is quite large in the Indian market, because most of the dhootie trade is done in that way. It is large also in

the China trade, as it is a popular way of buying the white shirtings which are a staple fabric there. In the China trade also a large proportion of the Manchester export is disposed of through the system of weekly auctions held in Shanghai, and this must be counted as consignment business. In the trade with Egypt almost the whole trade is accounted for by consignment, with this important consideration. To deal properly with consignment, a large organization is necessary with well-established representation abroad. In the Egyptian trade, however, the few large houses do not dominate the trade, and there is a horde of small shippers of the "follow-my-leader" type. The result is a seasonal excess of shipments to Egypt, which leads to long periods of stagnation owing to the indigestibility of stocks. In the South American trade the proportion of consignment business is smaller.

It is the general practice of the shipper to buy cloth in the grey state, to pay for it within 14 days, and to ship it abroad for sale. He will often have to wait three months to be paid, and if the goods have to be bleached, dyed, or printed before being shipped, another period of anything up to three months may be interposed during which the shipper may finance the goods. When the goods are put on board ship it is, of course, possible to have documents of title and to obtain reimbursement, either by selling the documents outright or by borrowing on their security. While grey cloth is going through the various finishing processes, it is also possible to obtain credit by pledging the goods. Some finance houses make a regular business of providing this type of credit, but most of the larger shippers pride themselves on relying entirely on their own resources. The shipper performs a very important function in the financing of trade. He also carries a very high proportion

of the risk. He is, therefore, the middleman *par excellence*.

Between the spinner and the manufacturer there exists, as already described in the previous section, a large body of middlemen known as yarn agents. Between the manufacturer and the main distributor, whether it is the shipping house or the home trade warehouse, there is a large class of cloth agents, some of whom confine their attention to grey cloth, and also a specialized form of middleman who calls himself the "stock" house. These hold stocks chiefly of highly-finished fancy woven fabrics which are seldom wanted in bulk quantities. Their function is to forecast the trend of fashion and seasonal demand.

In a highly specialized industry like that of Lancashire, the middleman plays an important rôle. He ensures that a competitive price is quoted on 'Change. In fact, he replaces the dealing by outcry in closed markets. Large spinners or manufacturers, of course, do not need the middleman. They have resources which enable them to keep in close touch with the market and with all potential buyers. But the smaller concern producing a specialized article is in a different position. The man in control has not the time or the experience to keep in touch with all the firms who may at short notice want the particular yarn or cloth which he alone in the market can supply for the particular delivery date wanted. It is the agent's business to know and to keep in touch with the requirements of manufacturers and shippers. It is his business to know who has stock of particular qualities, who wants work, and who is likely to quote the cheapest price. He normally gets a discount of 4 per cent from the firm he buys from and he gives a discount of 2½ per cent to the firm he sells to. (The grey cloth agent gives only 2 per cent.) The agent, therefore, gets a gross

commission of $1\frac{1}{2}$ per cent, out of which he pays his own expenses, and, of course, in times of adversity, competition tends to reduce the margin. The agent seldom handles the goods; they are transferred direct from buyer to seller, but there is such a variety of practice that it is almost unsafe to utter any generalization. Some agents are in a position to carry stocks. Some have the privilege of selling the whole output of certain mills or weaving sheds. They may even own the concerns which make the yarn or cloth, and in several cases they will have given financial accommodation to the spinner or manufacturer. The disastrous experience of the past ten years, however, has severely reduced the amount of accommodation which agents can offer producers. One result of these exclusive selling commissions is that the agent is in the position to offer a certain quality of cloth and to maintain its quality strictly. It is also the general practice for the agent to guarantee the transaction.

THE CAPITALIZATION OF A COTTON MILL

In a previous chapter a description has been given of the methods of finance usually adopted in dealing with raw cotton by the merchants and importers abroad and in Liverpool. The present section will be confined to the methods of capitalization and finance usual in the manufacturing end of the industry, and the question will be dealt with under two heads—the capitalization of a cotton mill, and the financing of the Lancashire industry, with special reference to the merchanting side of the trade.

In such a description the first point is the particular way in which the business is constituted or financed, for this may seriously affect the position of possible creditors. The business may belong to one individual

or to a firm consisting of two or more individuals. It may be a limited liability company constituted under the Joint Stock Companies Acts, or a company incorporated by Royal Charter or by special Act of Parliament.

The characteristic of the Liverpool end of the trade is that limited companies are practically unknown, because none but individuals can be members of the Liverpool Cotton Association, and they must be so, with full responsibility as individuals, not merely as representatives of a joint stock company. In the spinning end of the industry, on the other hand, joint stock companies with large capital are the rule. The main difference between a firm and a limited company is that each partner is responsible for all the liabilities of the firm, and no partner can limit his liability in respect to partnership debts as against the creditors. The only exception is what is known as a limited partnership under the Partnership Act of 1907, under which there must be at least one partner having unlimited liability. The limited partners must contribute a definite sum of money or money's worth, and must not in any way interfere with the management of the concern. If by any act of his a limited partner should lead a creditor to deal with the firm in the belief that he is a managing partner his liability may become unlimited.

Joint stock companies with limited liability are subject to the Companies Acts of 1862 to 1908. The 1907 Act created a new form, known as a private limited liability company. This may consist of two and not more than fifty shareholders, and no shares must be offered to the public. The company is usually a conversion from a firm, and the partners and their nominees hold the shares, the conversion being effected with the object of obtaining the privilege of limited liability and other advantages, such as the power to borrow on debenture.

Public Limited Companies. By dealing *seriatim* with the items in a balance sheet we shall see how a company is financed, and how the capital, loans, and credit shown on the liability side are dealt with. Capital in the narrow sense consists of shares, usually divided into ordinary and preference shares, the liability of the shareholder being limited to the nominal amount of the shares. The capital is fixed by the Memorandum of Association at a certain amount termed nominal capital, only a part of which, however, is usually issued. The shares issued may be of any denomination, and may be fully or partly paid. Uncalled capital is an important item in the eyes of a creditor, because in the event of liquidation it must be called up for the payment of creditors if the assets of the company should prove insufficient for the purpose.

Shareholders sometimes imagine that a refusal to meet the liability for uncalled capital will only entail forfeiture of the shares, and again that a sale of shares frees the shareholder from further liability. But shares can only be forfeited when the Articles of Association give the directors power to do so, and directors must, subject to the discretion clause in the Articles, sue the shareholder for his unpaid calls. Should the company be wound up within a year after he ceased to be a member, i.e. after the transfer of the shares was *registered*, and the new holder of the shares fails to meet the unpaid calls, the original shareholder is still liable. Again, the right of the shareholder to set off debts due to him by the company (e.g. loans) against unpaid calls, lapses in the event of liquidation, and may do so on the appointment of a Receiver under a debenture.

Preference Shares are not so popular in the cotton trade as in other industries. Note that unless so stated in the Articles of Association a Preference shareholder

has no priority over other shareholders in a winding-up, but such a provision is almost invariably made.

Debentures are merely an obligation for money borrowed. It is usual to give the debenture holder a charge over some part or the whole of the assets of a company, but this should always be inquired into and the scope of the charge ascertained, e.g. whether it is merely a floating charge, and if so, does it prevent the creation of a fixed charge in priority to the debentures, or is it a fixed charge on certain specific assets, together with a general or floating charge? Particulars of any mortgage or charge must be kept by the company and may be inspected by creditors.

Loans. The borrowing of money on loan, as practised in the Lancashire cotton industry, especially the Oldham section, is not peculiar to that industry, but no other industry has relied so extensively on that method of augmenting capital. The loanholder is an ordinary creditor, with no special privileges. Some spinning companies are financed by loans to amounts which considerably exceed the paid-up capital. In ordinary times this form of borrowing had a great advantage, as it enabled a company to keep its capital low relative to the value of its assets and consequently to its productive and profit-earning capacity, and as the interest on loan money was fixed at a relatively low rate, 3 per cent to 5 per cent, free of tax, the amount of profit available to shareholders enabled the company to pay a higher dividend than if the whole of this money had been in the form of capital. The disadvantage of this form of borrowing is that during times of depression, when employment and profits are low, demands for repayment are more likely, and interest has to be met, whereas had it been share capital the principal would have been fixed and there would have been no liability

to pay interest, because the dividend on capital depends on the profit-earning capacity of the company.

The policy of reconstruction which so dominated the industry in 1919 and 1920 placed a big strain on many mills in this connection. Owing to the higher general rates of interest ruling and the large profits being earned on capital, it was necessary to offer higher rates of interest on loan. With an income tax ruling at 5s. to 6s. in the £ the attractiveness of this form of investment to a class which had been brought up to look upon it as a safe and easily accessible one can be readily appreciated.

In addition to the ordinary loans there are frequently large sums lent by cotton merchants and brokers, by yarn agents and waste dealers. This policy of borrowing from trade creditors is bad; it tends to restrict the purchasing or selling power of the company. Even though a written contract may not be in existence the company is equally bound, because of the fear of a withdrawal of the loan. It is not the duty of a creditor to act as overseer to the board of a mill. A mill should be free and unfettered in its trading, and if its directors are incompetent the shareholders should take steps to appoint a new board.

The Bank. In the days before reconstruction the bank overdraft was not, as a rule, a serious item. After the reconstruction of so many of the Lancashire mills and the subsequent slump, numbers of these companies found themselves heavily indebted to their bankers and the banks were landed with dead loans, which in the aggregate must amount to a considerable figure. During the prolonged slump these companies have had to provide heavy sums for bank interest or alternatively see that interest added half-yearly to capital, accumulating compound interest, in addition to the heavy sums to be provided for loan interest previously mentioned. The

companies borrowed their money at a period of inflation and depreciated currency ; before they can hope to pay dividends in many cases they will have to repay that money, and that repayment will have to be made at a time of deflation and appreciated currency.

Acceptances. The method of dealing with these in connection with cotton purchases has already been explained.¹ A mill buys cotton, say, from America, c.i.f., and arranges for the seller to draw on the mill company or on their bankers, the latter being the more usual practice.

Creditors, apart from the loans already referred to, are rarely an important item in a mill balance sheet. Generally the largest item is the amount owing for cotton in the case of a spinning company, or for yarn in the case of a doubling or weaving company. Extended credit for cotton should only be given if the cotton merchant or broker is well informed as to the financial position of the mill. Other creditors may be for coal, belting, and the various supplies and appliances used in the process of manufacture. The replacements of machinery may also appear here, and sometimes a company is supplied with machinery on long credit terms.

Assets. On the assets side of the balance sheet we see that the chief item is plant, machinery, and buildings. This item should not be greater than the paid-up capital, which ought to be large enough to cover the cost of the machinery, with a balance for working capital. Owing to the system of loan capital, however, this is frequently not the case, and since the reconstruction period we have frequently to include the bank overdraft also.

The value of machinery in a spinning mill is generally spoken of in terms of " mule spindles." If it is a ring mill, the rings are converted to the equivalent of mules

¹ See Chapter II, page 102.

✓at a ratio of one and a half mules to one ring. This is only a rough and ready estimate, for it assumes an average mill, but does not take into account, for instance, the additional machinery which a ring mill may have for winding, beaming, warping, etc., or the age of the mill, or the age or condition of the machinery. It may be remarked here that where a charge or debenture covers only the fixed assets there is a considerable element of doubt as to whether ring-spinning machinery ✓ would be covered, because these machines are not bolted to the floor.

Before the war, the complete cost of erecting a cotton mill, including buildings and machinery, worked out at about £2 per mule spindle, but existing mills frequently changed hands at about £1 per spindle. During the post-war boom (1919-20) when new building was impossible and the "reconstruction" craze was at its height, prices as high as £7 per spindle were actually paid, but this, of course, could not last. In 1927 the cost of erecting a new mill was still above pre-war rates; but where mills changed hands, generally under forced sales, prices well below the pre-war figure of £1 per ✓ spindle were reported.

Depreciation may form a reserve item on the liabilities side of the balance sheet, leaving the original valuation of plant, machinery, and buildings on the assets side, except for the additions which may be made from time to time; or the depreciation allowance may be apportioned and deducted on the assets side from each item of plant, machinery, and buildings, or deducted as one amount from the total of those items. It is the common practice to employ in the company the sum reserved for depreciation. This practice is followed because it adds to the capital resources of the company, and in good times its earning capacity is no doubt greater than it

would be if invested outside. Although this may be a strong argument in its favour, it has great disadvantages. The object of a depreciation fund is to keep up the capital value of the machinery, etc., or, in other words, to provide a sum which at the end of a certain period will be sufficient to replace the machinery, etc., when worn out. If this fund is utilized in the conduct of the company it would be difficult, if not impossible, to use it for the purchase of new machinery. On the other hand, if the fund is invested outside the business it is more readily available for the purpose for which it was intended.

Stock. The stock of a spinning mill consists of raw cotton, cotton in process, and yarn. The stock of a mule spindle mill is usually less than of a ring mill. The reason is that the mule spinning process ends with the cop, whereas in a ring mill not only is the yarn sold in the cop, or, more correctly speaking, bobbin, but is carried on to winding, bundles, beams, and various other processes. Stock-taking lends itself to considerable "wangling." It is possible to hide losses, or increase or reduce profits by manipulating the stock figures, but the creditor has no means of checking this.

Debtors and Bills Receivable represent amounts due to the company for sales of yarn or cloth, and call for no comment.

After the post-war boom and the deflation slump the Lancashire cotton industry passed through a long period of depression, during which demand never equalled supply on the basis of full-time production, even though the normal working hours had been reduced from 55½ to 48 hours. With a view to rectifying the position a policy of organized short time was adopted with some success, but that did not go to the root of the matter, and it was discontinued in December, 1926, when the scarcity of the raw material had completely

disappeared and the coal strike had come to an end. The trouble was that the cost of production was too high, and short time only made it higher. One means of reducing these costs lay in the alteration of the finances of many of the mills by reducing the interest charges on loan capital and debts to the banks, and that could only be done in most cases by calling up the uncalled capital.

FINANCING THE LANCASHIRE INDUSTRY

In the merchanting end of the trade, much less use is made of the joint stock company form of business, most of the trade being carried on by individuals or private firms, many of them with large financial resources, but these are normally supplemented by the use of the ordinary commercial forms of finance through the banks. A banker must know how to lend money, to whom to lend, when to lend, and how much to lend. In the first place he must form a reliable estimate of the character and ability of the customer seeking to borrow. Then a due proportion must be observed between the capital of the concern and the assistance afforded to it. It is no part of a banker's duty to provide his customer with the bulk of his capital. His real function is the granting of loans to meet temporary requirements. The point which a banker must ever keep before him is liquidity.

Again, in lending money, the state of finance and trade in general must be taken into account. When trade is in a stable and flourishing condition loans may be made with comparative freedom; but when conditions are unfavourable and credit is shrinking, much greater care must be exercised. There is, however, nothing more harmful than a policy which lends money too freely in times of prosperity, and calls in advances indiscriminately at the first breath of trouble. The banker should

act as a stabilizer to the commercial structure. In general, an advance is justified by one of two things, the general position of the borrower or the security offered. Not even the deposit of adequate security justifies a banker in lending an amount out of all relation to the customer's own capital and the requirements of his ordinary business.

The question of financing the importing of the raw cotton, whether by cotton merchants or by the spinner direct, has already been dealt with in a previous chapter, as well as the part played in this system by the use of the futures market for hedging purposes. This section, therefore, will deal only with the financing of the yarn and cloth.

The Yarn Agent. The yarn trade is essentially a quick trade. The agent, if he is nothing more than an agent, runs little risk, because he is protected both ways by his contracts. If he is a *del credere* agent, as described in a previous section,¹ he also runs the risk of his customer's failure. If, as sometimes happens, he "takes a view" of the market, becoming in effect a merchant, this, of course, involves heavy risks. Where it is necessary to ask the banker's assistance such help is usually given against security or upon the general strength of the applicant's position. A prudent banker will hesitate to grant unsecured accommodation to a yarn merchant who confessedly speculates on the turn of the market unless the resources behind him are very substantial.

The rapidity of turnover as a rule precludes the warehousing of the yarn to the order of the banker, and so the goods are not, generally speaking, available as cover. Where they are pledged it is generally when the customer has got into difficulties and the banker takes the yarn to protect his position.

¹ See page 144.

The Production of Cloth. The bulk of the financing is done upon open overdraft either with or without security, but in some cases a manufacturer—using the term in the sense of millmaster as well as that of a merchant who claims the designation of a manufacturer—will find himself under the necessity of pledging his cloth. The goods are in some instances stored in the warehouse of a third party, who engages to hold them to the order of the banker, and speaking generally a perfectly valid security can be obtained in this way. Occasionally, however, it may be necessary to obtain a charge upon cloth stored upon the premises of the borrower. The basis of the security is physical possession. The pledgee, i.e. the banker, must be able at any moment to call for, take possession of, and remove the goods. The goods which are to form the subject of the pledge are stored in a locked room, and the key is handed to the banker, who appoints an agent to control the goods on his behalf. There should be written evidence of the appointment and of the fact that the key has been handed over to the agent. No cloth will be taken out of store except under the written authority of the banker to his representative. The valuation of the cloth is, of course, a matter of importance. There are certain precautions which should be taken : (1) The banker must assure himself that the goods are adequately insured against damage by fire ; (2) a periodic inspection of the goods should be made by a regular member of the bank's staff to ensure the accuracy of the tally ; (3) care should be taken to see that any particular parcel of goods does not remain in store for an inordinate length of time.

The Grey Cloth Agent. In due course the cloth is disposed of and passes into the hands of the merchant bound either for the home market or for export. There may be the intervention of the grey cloth agent, who

deals on lines similar to the yarn agent. The grey cloth agent is, however, usually a merchant, i.e. he stands the risk both of the market and of the solvency of his customer, but if he is wise he will cover his sales just like the yarn merchant. The grey cloth agent sells to the merchant, the man who is actually responsible for the distribution of the goods.

The Merchant. The foreign merchant is usually spoken of as a shipper. The merchant, like anyone else, must borrow, and he, too, may be financed upon open overdraft, either with or without security. But the home trade merchant does not require the same extended facilities as the foreign shipper. The credit which he has to afford is not so long, and the assistance granted to him is usually by way of overdraft against security or upon the strength of his general position. In the case of the shipper his cloth will usually be bought in the grey or unbleached state. According to his market he will require it bleached, dyed, or finished, and as these processes take some weeks he has a large amount of capital sunk in goods in process. He may pledge the cloth by instructing the bleacher or finisher to hold it to the banker's order. A bleacher or finisher has a paramount lien upon goods in his hands until his charges are paid, and this lien will extend to cover not only charges upon that particular parcel of goods, but also any unpaid amount owing to the bleacher or finisher. When the goods are finished, if they are for shipment they go to the packers, and here again delay may occur, and the banker's aid may be invoked either against the goods or by an additional overdraft.

This leads to the manner in which the merchant shipper receives payment. The business is chiefly done by means of credits, and these arise in two ways. Take the case of a merchant in Shanghai who is desirous of

importing Manchester goods. He goes to his banker in Shanghai and requests the latter to open a credit on his behalf with the banker's London or Manchester house—usually London—under which payment of a certain amount will be made to the Manchester merchant upon delivery of shipping documents. Assuming the answer is favourable, the Shanghai banker will request his London house to open the credit; the latter will advise the Manchester merchant, and all that the Manchester merchant has to do is to present his documents. These credits are of two kinds, confirmed and unconfirmed. An unconfirmed credit can be revoked at any time by the person at whose instance it has been opened, or, if circumstances permit, by the banker who has opened it. A confirmed credit, on the other hand, can only be revoked with the consent of all parties.

There is, however, another class of credits. These are usually revolving credits, and are opened in favour of the Manchester merchant by the Eastern banks and the merchant bankers and finance houses in London. The merchant is empowered to draw upon the merchant banker for a given proportion, say 80 or 90 per cent of the value of his shipments, with a limitation upon the amount of his drafts outstanding at any one time. The documents relating to the shipments are handed to the banker granting the credit and the proceeds are collected in due course. Out of them the merchant banker reimburses himself for the payment which he is called upon to make on the maturity of his acceptance and the surplus is in due course paid over. Pending collection of the proceeds of the goods the London banker has the security of the documents or of the goods represented by them. The Eastern banks are in a particularly favourable position to do this class of business. They have their own go-downs or warehouses abroad, and if

there is any hitch they are in a favourable position in regard to the warehousing and subsequent disposal of the goods. The Manchester merchant is in possession of a fine bill, and he discounts it either with his own banker or with a discount house. He is, of course, still under a contingent liability if the proceeds of the goods prove to be insufficient to meet the London banker's acceptance.

Occasionally a merchant will send goods abroad on consignment or on joint account. It may be part of the arrangement that the shipper is authorized to draw bills upon his foreign correspondent for an agreed proportion of the estimated value of the goods. If the goods are shipped on joint account the profits or losses of the transaction are shared. The shipping of goods on consignment is a class of business which the banker does not like. By the time the goods arrive market conditions may have altered, and if the goods cannot readily be disposed of it may be necessary to sell them for the best price they will fetch.

Lecturers.—B. Hesketh, the late Prof. Wm. Myers, M.Sc., J. R. Hannay, J. Millward, Owen Jones, B.A., W. E. Shepherd, W. Cunliffe.

References

History of the Cotton Manufacture in Great Britain (Edward Baines, Jr.), 1835.

The Lancashire Cotton Industry (1904) and *The Cotton Industry and Trade* (1905), by Sir S. J. Chapman.

Cotton Spinning (Morris Wilkinson), Longmans.

Cotton Weaving and Designing (John T. Taylor), Longmans.

Bleaching and Calico Printing (George Duerr), Griffins.

The Romance of the Cotton Industry in England (Wood and Wilmore), Oxford University Press, 1927.

CHAPTER IV

THE WORLD'S CONSUMPTION OF COTTON AND COTTON GOODS

THE account of the Lancashire cotton industry given in the previous chapter may serve as an outline of the chief manufacturing processes through which cotton passes in its progress from the raw material to the finished goods, and these processes are roughly the same in every country where cotton spinning and manufacturing are carried on in factories on a large scale. The next stage in our survey of the cotton world is to describe the distribution of the cotton manufacturing industry throughout the world, and the most convenient point at which to begin is the distribution of the world's spindleage among all these countries. In doing so, however, it must be remembered that cotton spinning and weaving are not confined to factories where machinery is employed on a large scale. There are still many countries where a considerable proportion of the total consumption of cotton goes on quite outside of factories, the cotton being spun and woven by hand with the most primitive appliances. This domestic consumption is rather a disturbing factor in any attempt to strike a balance of the world's production and consumption of cotton, but the difficulty is lessened by the fact that much of the cotton consumed in this way never comes into commercial channels at all, being taken straight from the fields to the homes of the growers or their neighbours by whom it is used, and, therefore, never appears on either side of the balance sheet. In China a large part of the native crop is never even spun at all, being used in the form of quilted or padded garments.

Apart from such purely domestic consumption, however, the cotton trade is peculiarly well supplied with statistics. On the production side the records go back a very long way ; while on the consumption side, since the establishment in 1903 of the International Federation of Master Cotton Spinners and Manufacturers' Associations, their periodical figures of mill consumption and stocks for the whole world have been steadily gaining in completeness and reliability, except, of course, during the war, when the compilation was inevitably suspended. It is therefore to their returns that we look for the statistics of world spindleage, and the table on page 167 gives the history of the industry since 1905.

From this table it appears that the world's spindleage has been increasing steadily during the whole period, except 1920-21, but the distribution throughout the world shows very interesting changes since the war. The U.K. spindles were increasing steadily up to the war, though latterly the rate of increase was checking, and the same tendency has been continued since the war. The very high figure for 1919-20 must be regarded as abnormal and the result of the post-war boom. The Continent as a whole shows much the same tendency as the United Kingdom, but there are, of course, some very interesting changes in the distribution of the spindles of the belligerent countries. But the most striking changes are in Asia and America. India, Japan, and China have all developed very rapidly since the war, with the result that their total spindles to-day are nearly twice as many as in 1913. In the United States the development has not been so rapid, but the actual increase (about 6,000,000 spindles) is not far short of the total increase in Asia. The result is that there has been a definite shifting of the centre of the industry. The United Kingdom and Continent before the war accounted

SPINDLEAGE OF PRINCIPAL GROUPS OF COUNTRIES
From the Statistics of the International Cotton Federation. (ooo's Omitted)

Date		Great Britain		Continent		Asia		U.S.A.		Others	Total
			% of Total		% of Total		% of Total		% of Total		
31st August,	1905	46,000	40·9	32,654	29·1	7,301	5·7	23,687	21·0	2,550	112,192
"	1906	48,826	41·0	35,225	29·5	7,480	6·3	25,250	21·1	2,550	119,331
"	1907	50,680	41·2	35,591	29·1	7,566	6·2	26,375	21·4	2,549	122,761
"	1908	52,818	40·8	38,570	29·8	7,887	6·1	27,505	21·3	2,653	129,433
"	1909	53,312	40·6	39,423	29·9	8,282	6·3	28,018	21·3	2,705	131,740
"	1910	53,397	40·1	40,578	30·4	8,355	6·3	28,266	21·3	2,705	133,301
"	1911	54,523	39·6	41,848	30·4	9,131	6·6	29,523	21·5	2,905	137,930
"	1912	55,317	39·3	42,942	30·4	9,272	6·6	30,579	21·8	2,870	140,980
"	1913	55,653	38·8	43,856	30·6	9,348	6·5	31,520	22·0	2,955	143,332
(Statistics not compiled during the war)											
31st July,	1920	58,692	38·2	43,603	28·4	11,980	7·8	35,834	23·4	3,770	153,879
"	1921	56,141	36·9	43,417	28·5	12,690	8·3	36,478	23·9	3,591	152,317
"	1922	56,605	36·7	43,143	28·0	13,765	8·9	36,943	23·9	3,657	154,113
"	1923	56,583	36·3	43,358	27·8	14,888	9·5	37,397	24·0	3,821	156,047
"	1924	56,750	35·7	43,474	27·4	16,053	10·1	37,786	23·8	4,720	158,773
"	1925	57,116	35·4	44,008	27·4	17,142	10·6	37,937	23·5	5,160	161,363
"	1926	57,286	35·1	45,642	27·8	17,519	10·7	37,585	22·9	5,691	163,723
31st Jan.,	1927	57,548	35·0	46,105	28·0	17,827	10·9	37,374	22·6	5,762	164,616

for 70 per cent of the world's total ; in January, 1927, they were only 63 per cent of the total.

In the Federation statistics the spindleage of each country is classified into mule and ring spindles, and as this classification throws an interesting light on the general character of the industry in each country, the facts are summarized in the table on page 169, which shows the percentage of mule spindles in each country in certain selected years. In this table there is also included a column giving the consumption per thousand spindles in each country, which again is a useful index of the general character of the industry. The consumption per thousand spindles is in inverse ratio to the general quality of the goods produced, and bears a certain relation to the proportion of mule spindles, for mule spindles, as a rule, are used for finer cotton. Thus, Switzerland and England have the smallest consumption per thousand spindles and the largest percentage of mule spindles, because in these countries a large proportion of the cotton used is Egyptian. Japan, at the other extreme, has the highest consumption per thousand spindles, partly because they use largely Indian and Chinese cotton, and manufacture mostly heavy goods, and also because Japan is still working on a double shift system, which means that the mills are running practically night and day. On the other hand, changes in the consumption per 1,000 spindles sometimes indicate the effects of short time or a strike, as in the United Kingdom and India in 1925-26.

Turning now to the figures of consumption, before the war the Federation published only the actual returns received from each country, with an estimate of its total spindleage. From this it was possible to calculate the total consumption in each country of each variety of cotton, though this involved two assumptions, viz.,

DETAILS OF SPINDLEAGE AND CONSUMPTION PER 1,000 SPINDLES

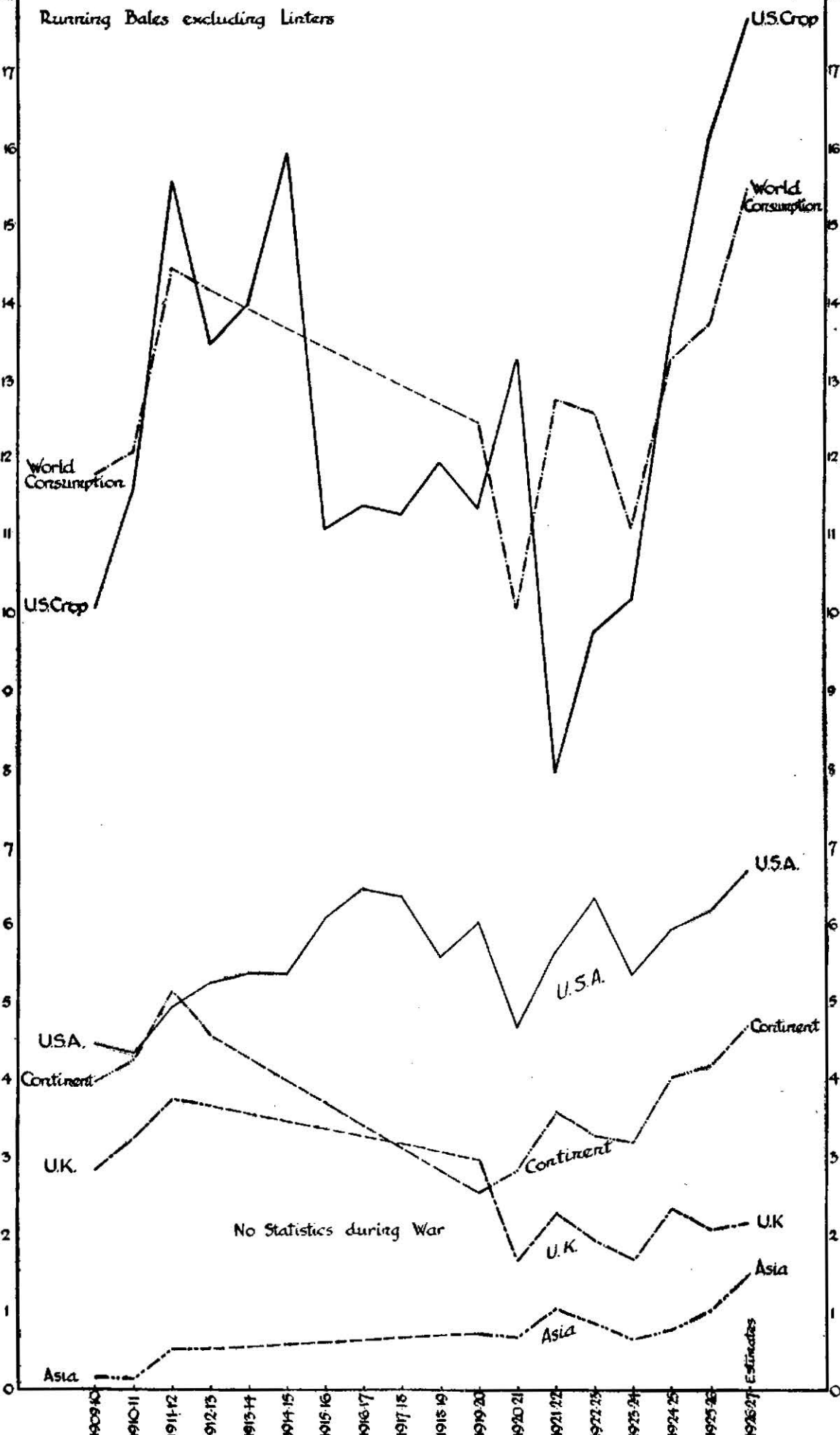
Country	1907-08			1912-13			1919-20			1925-26		
	Total Spindles	% Mule	Cons. per 000 sp.	Total Spindles	% Mule	Cons. per 000 sp.	Total Spindles	% Mule	Cons. per 000 sp.	Total Spindles	% Mule	Cons. per 000 sp.
	(000's)		(bales)	(000's)		(bales)	(000's)		(bales)	(000's)		(bales)
Great Britain	52,818	83.6	72.7	55,653	81.2	76.8	58,692	78.0	63.7	57,286	76.6	52.8
France	6,731	60.0	141.2	7,400	54.2	136.5	9,400	47.4	111.3	9,511	40.0	124.0
Germany	9,883	57.1	181.5	11,186	46.0	158.0	9,400	48.0	92.7	10,480	45.6	109.3
Russia	7,855	50.2	250.1	7,668	42.9	270.0	7,100 ^a	(no returns)	7,246	40.0	331.2	
Poland	(Included in Russia)			1,322	33.2	312.8	1,400	22.8	64.5	1,375	31.8	138.2
Finland				222	30.7	156.5	240	28.4	109.5	255	22.7	152.9
Italy	4,181	26.6	245.7	4,600	24.7	171.7	4,514	24.7	170.5	4,833	15.2	215.0
Czecho-Slovakia				(Included in Austria)			3,584	56.2	61.0	3,568	49.3	134.0
Austria	4,026	61.2	183.8	4,909	51.2	170.5	1,140 ^a	(no returns)	1,032	43.3	154.5	
Spain	1,850	40.0	185.4	2,000	40.0	179.4	1,800	38.9	216.7	1,817	34.4	224.0
Belgium	1,162	51.6	182.8	1,492	33.2	172.5	1,572	28.9	160.1	1,854	25.6	191.0
Switzerland	1,493	85.8	63.6	1,398	82.0	70.5	1,536	59.6	57.6	1,520	52.0	74.6
Holland	396	47.0	195.2	479	41.2	177.2	598	33.2	181.8	921	26.7	165.0
Sweden	390	31.6	227.8	534	27.3	215.8	670	23.1	175.2	571	17.0	159.5
Portugal	450	33.3	180.2	480	26.7	163.6	482	17.0	140.0	503	34.4	168.5
Denmark	78	16.7	267.8	90	15.6	284.9	92	11.0	254.5	94	8.5	224.0
Norway	75	29.4	150.2	75	28.0	154.2	73	21.0	170.5	53	26.4	113.5
TOTAL—Continent	38,570	53.1		43,856	44.9		43,603	41.2		45,642	38.1	
India	5,500	28.0	399.3	6,084	27.6	357.9	6,690	18.6	318.8	8,510	11.5	242.5
Japan	1,637	3.3	625.3	2,300	2.3	690.6	1,600	1.2	660.3	5,573	0.6	505.0
China	750			964		666.0	3,690		539.0	3,436		510.2
TOTAL—Asia	7,887	11.2		9,348	17.0		11,980	10.3		17,519	5.8	
U.S.A.	27,505	17.8	164.3	31,520	13.1	183.7	35,834	9.2	181.0	37,585	6.9	170.0
Canada	795	46.0	144.5	855	45.2	132.7	1,200	30.6	173.9	1,167	19.2	180.5
Mexico	730	4.0	223.2	700	20.9	227.0	720	4.4	174.9	830	0.6	268.0
Brazil	1,000	3.0	540.2	1,200	0.5	423.6	1,600	0.3	228.0	2,493	0.1	314.0
All others	128			200			250			1,201	0.1	
GRAND TOTAL	129,433	55.3		143,332	45.7		153,879	44.7		162,723	39.9	

that the spindles which had not been returned were consuming cotton at the same rate as those included in the returns, and that their consumption was distributed in the same ratio over the different varieties. The latter assumption is perhaps rather dangerous, but it is probable that any error resulting from it will not vary much from year to year. Since the war the Federation have themselves made this calculation of the estimated total consumption, and latterly they have ceased to publish the figures of actual returns, giving only the estimated totals. The table on page 171, gives these estimates for the last two pre-war seasons, and for each season since the war.

So far as the consumption of American is concerned the position is so striking that it deserves to be put down in more visible form in a diagram, which is therefore given inset. This brings out very clearly the fact that while the world's consumption of American had by 1925-26 recovered practically to pre-war figures, the distribution of that consumption throughout the different manufacturing countries was materially changed, for, while the United Kingdom and the Continent were still substantially below pre-war figures, the U.S.A., Asia, and other countries had materially increased their consumption. As the U.S.A. is the only country for which figures are available throughout the war period it is of interest to give a table of the details of their consumption since 1908 (see p. 172), and particularly to note the proportion of the total crop consumed in the U.S.A.

Regarding the consumption of other varieties the chief point of interest is the way in which the scarcity of American resulting from the bad crops of 1921-23 was mitigated by the substitution of other varieties. Thus the consumption of Indian in England and on the Continent was very small before the war, but in 1923-26

MILLION BALES
AMERICAN COTTON U.S. Crop and World Consumption



WORLD'S CONSUMPTION OF ALL KINDS OF COTTON
(From the Statistics of the International Federation. Running Bales, 000's omitted)

Variety	Season	U.K.	Conti- nent ¹	U.S.A.	Asia	All Others	Totals	
<i>American</i> (including Linters in U.S.A., as shown in brackets)	1911-12	3,734	5,137	5,160 (238)	507	140	14,678	
	1912-13	3,667	4,593	5,553 (303)	519	124	14,456	
	1919-20	2,980	2,538	6,345 (342)	709	209	12,781	
	1920-21	1,678	2,802	5,193 (516)	684	192	10,540	
	1921-22	2,275	3,593	6,252 (639)	1,031	216	13,267	
	1922-23	1,919	3,293	6,968 (646)	859	201	13,240	
	1923-24	1,695	3,199	5,890 (537)	661	172	11,617	
	1924-25	2,344	4,009	6,576 (659)	772	228	13,029	
	1925-26	2,093	4,194	6,980 (804)	1,012	261	14,540	
	1926-27							
	First half	940	2,387	3,681 (305)	686	124	7,818	
<i>Indian</i>	1911-12	45	801	9	3,014		3,869	
	1912-13	53	813		3,073	2	3,941	
	1919-20	58	444	12	3,196		3,710	
	1920-21	39	770	10	3,749	2	4,570	
	1921-22	55	824	11	4,032		4,922	
	1922-23	107	977	21	4,276	1	5,382	
	1923-24	201	1,247	27	3,922	7	5,404	
	1924-25	183	1,108	31	4,165	34	5,521	
	1925-26	168	1,063	30	4,273	38	5,572	
	1926-27							
	First half	48	475	13	2,268	14	2,818	
<i>Egyptian</i>	1911-12	374	374	120	23	2	893	
	1912-13	393	380	134	17	12	936	
	1919-20	441	173	216	24		854	
	1920-21	237	136	106	22	13	514	
	1921-22	336	208	151	38	9	742	
	1922-23	393	272	175	40	10	890	
	1923-24	469	354	149	39	16	1,027	
	1924-25	431	350	128	49	13	971	
	1925-26	391	334	136	42	17	920	
	1926-27							
	First half	186	188	74	27	12	487	
<i>Sundries</i>	1911-12	120	1,764	20	740 ²	1,060	3,713	
	1912-13	161	2,128	32	798 ²	818	3,937	
	1919-20	141	116	100	1,077	614	2,108	
	1920-21	70	1,030	67	981	672	2,829	
	1921-22	199	716	114	980	708	2,717	
	1922-23	351	616	98	1,262	850	3,177	
	1923-24	353	529	76	1,351	576	2,895	
	1924-25	277	806	66	1,523	785	3,547	
	1925-26	370	1,619	58	1,308	1,103	4,458	
	1926-27							
	First half	242	689	29	724	347	2,001	
<i>All Kinds</i>	1911-12	4,274	8,075	5,399	4,293	1,202	23,153	
	1912-13	4,274	7,914	5,719	4,407	956	23,270	
	1919-20	3,020	3,271	6,733	5,006	823	19,453	
	1920-21	2,024	4,747	5,376	5,436	879	18,462	
	1921-22	2,605	5,341	6,528	6,081	933	21,748	
	1922-23	2,770	5,158	7,262	6,437	1,062	22,689	
	1923-24	2,718	5,329	6,142	5,973	771	20,933	
	1924-25	3,235	6,363	6,801	6,509	1,060	23,968	
	1925-26	3,022	7,210	7,204	6,635	1,419	25,490	
	1926-27							
	First half	1,416	3,709	3,797	3,705	497	13,124	

¹ No returns from Russia and Austria in 1919-20.

² Including China from a private estimate in 1911-12 and 1912-13.

it was quite substantial. Of Egyptian, on the other hand, England has always taken the lion's share, and this actually increased even above pre-war figures during 1919-20 and 1923-25. With regard to the consumption of sundries, the figures require to be taken with caution (especially in those countries like China, Russia, and Brazil, where this consumption consists of native cotton), because the figures are given in running bales of varying weight, which in many cases are below 500 lb. As the crop statistics are approximately in 500 lb. bales it would appear, for example, that the consumption in Russia is sometimes more than the total crop which, of course, is misleading. For the United Kingdom,

U.S.A. CONSUMPTION OF COTTON

(In Running Bales. 000's Omitted. Foreign in 500 lb. Bales)

Season	American Crop, ex. Linters	U.S.A. CONSUMPTION				LINTERS		
		American	% of Crop	Egyptian	Other Foreign	Total	Crop	Cons. in U.S.A.
1908-09	13,086	4,930	38	146	16	5,092	346	149
1909-10	10,073	4,466	44	131	25	4,622	313	177
1910-11	11,568	4,323	38	147	28	4,498	398	207
1911-12	15,553	4,922	32	180	27	5,129	556	238
1912-13	13,489	5,250	39	201	32	5,483	602	303
1913-14	13,983	5,383	39	151	43	5,577	631	307
1914-15	15,906	5,375	34	181	41	5,597	832	412
1915-16	11,068	6,081	55	269	48	6,398	945	881
1916-17	11,364	6,470	57	259	59	6,789	1,300	870
1917-18	11,248	6,383	57	136	47	6,566	1,096	1,119
1918-19	11,906	5,590	47	126	50	5,766	910	458
1919-20	11,326	6,003	53	323	94	6,420	595	342
1920-21	13,271	4,677	35	159	57	4,893	429	516
1921-22	7,978	5,613	71	226	70	5,910	382	639
1922-23	9,729	6,323	65	262	81	6,666	591	646
1923-24	10,171	5,353	53	224	104	5,681	640	536
1924-25	13,639	5,917	43	192	84	6,193	858	659
1925-26	16,123	6,176	38	204	76	6,486	1,045	804
1926-27	17,688							

however, this discrepancy matters little, and the figures of sundries consumed there are evidence of the really substantial part which outside growths, especially Empire cotton, played during the scarcity of American cotton.

The next question is the position of cotton in relation to England's industries as a whole. England is a great industrial country with an enormous foreign trade, and cotton is the greatest of her industries, and the most important single item in her exports and imports. It is too often assumed, however, that the importance of

POSITION OF COTTON IN BRITAIN'S FOREIGN TRADE
From Board of Trade Returns. £ millions

Year	Net Imports			Exports of U.K. Produce		
	Total	Raw Cotton	%	Total	Cotton Goods	%
1907	554	60	11	426	110	26
1908	513	48	9	377	95	25
1909	533	52	10	378	93	25
1910	574	62	14	430	106	25
1911	577	60	12	454	120	26
1912	633	69	14	487	122	25
1913	659	62	9	525	127	24
1914	602	48	8	431	90	21
1915	753	55	7	385	75	19
1916	851	75	9	506	104	21
1917	994	103	10	527	128	24
1918	1,285	150	12	501	158	32
1919	1,461	180	12	799	204	26
1920	1,710	223	13	1,334	401	30
1921	979	65	7	703	179	26
1922	899	82	9	720	187	26
1923	977	86	9	767	177	23
1924	1,137	110	10	801	199	25
1925	1,167	115	10	773	199	26
1926	1,117	75	7	652	154	24

the cotton trade lies entirely in its exports. It used to be said, for example, that of the week's production in Lancashire only two days were for the home trade, and all the rest for export. It is therefore of interest to take out such figures as are available with regard to this point.

As regards the position of cotton in our foreign trade the facts are very simple and easily ascertained. The table on page 173 gives the total values of our imports and exports, and the share of cotton in these figures. From this it will be seen that cotton forms about 10 per cent of our net imports, and about 25 per cent of the exports of United Kingdom manufactured goods.

On the other question, however, of the relative importance of home and foreign trade in the cotton industry it is much more difficult to get any figures, because there are no complete statistics of the total volume of the trade except in the Census of Production taken in 1907. That census was repeated in 1912, but was not finished when the war broke out, and the third census for the year 1924 is not yet complete. Certain preliminary figures have, however, been published, from which the following partial comparisons have been taken (see table page 175).

From these figures it is possible to get some idea of the importance of the export trade. Of the total yarns produced in 1907, 13·4 per cent in weight, and 17·2 per cent in value were exported. The percentage of weight exported had fallen to 12·3 per cent in 1912 and 11·8 per cent in 1924.

Of the piece goods produced in 1907, 88·9 per cent in volume, and 86 per cent in value were exported. The former figure had fallen to 85·9 per cent in 1912, and 85·7 per cent in 1924.

From these figures it is easy to calculate that in 1907 about 90 per cent in volume of the original output of yarn was exported, i.e. 13·4 per cent as yarn, and 88·9

CENSUS OF PRODUCTION STATISTICS
ooo's omitted throughout

	1907	1912	1924
Gross Output—Value £	174,601		
Materials Used—Cost £	128,697		
% of Gross Output	74		
Allowing for Duplication the Gross Output is Estimated at £	132,000		
Aggregate Net Output £	45,007	50,550	82,380
Estimated Output of Yarn (Single) . . . lb.	1,800,000	1,976,000	1,379,000
Valued at Approximately £	90,000		
Exports of Yarn lb.	241,077	243,850	163,056
% of Estimated Output	13.4	12.3	11.8
Valued at Approximately £	15,417	16,222	27,782
% of Total	17.2		
Piece Goods Made from the Yarns Retained in U.K. linear yds.	7,087,580	8,044,000	5,426,000
Valued (including Bleaching, Dyeing, and Finishing) at £	94,500		
Exports of Piece Goods linear yds.	6,297,708	6,912,920	4,648,719
Valued at £	81,049	91,624	153,448
% of Total	86		

per cent of the balance (86.6 per cent of the original output) retained and turned into piece goods in this country. The corresponding figure had fallen to 87.3 per cent in 1912 and 87.2 per cent in 1924. Apparently, therefore, the relative share of exports has only very slightly diminished since 1907, but the data available are too slight to justify any definite conclusions.

LANCASHIRE'S MARKETS

The next question is where and how Lancashire disposes of the very varied products which are generically described as cotton goods. In previous chapters a description has been given of the system under which yarns are made and sold, and the following sections will, therefore, be confined to the distribution of piece goods. It must be remembered, however, that, in addition to the yarns used for the manufacture of all kinds of fabrics in the ordinary sense of the word, large quantities of

cotton yarns are used for other purposes than weaving, e.g. for sewing cottons, ropes and twine, electric wire insulation, and for the manufacture of hosiery and lace.

Even "piece goods" cover an infinite variety of fabrics for different purposes. Clothing of all kinds is probably the ultimate destination of the largest share of piece goods, but there are many other uses, e.g. upholstery and furnishings, such as curtains, napery, and household cloths of all sorts, millinery (if that is not included under clothing), fabrics for industrial purposes, like bagging, wrapping materials, and belting, and other goods such as leather cloth, linoleum, aeroplane fabric, typewriter ribbons, bookbinder's cloth, motor tyre fabric, linings of boots, canvas shoes, and so on, *ad infinitum*.

Dealing first with the home trade, the merchandising and distribution of cotton goods throughout the country is primarily centred in the large wholesale houses, which vary greatly in their scope. First of all, there is the large wholesale house, which carries a great variety of goods, but does not confine its operations to textiles only. For instance it handles not only cotton, but also linen, silk, and woollen goods, and such articles as straw hats, furs, and haberdashery, besides furniture, etc. That is the extreme example of one type of distributing house. The general wholesale house, however, broadly speaking, confines itself to textile goods. These are sub-divided into (1) the heavy goods, e.g. domestic articles, such as sheets, towels, quilts, bed linen, etc.—again not confined to cotton—and (2) what may be called fancy goods, comprising such articles as hosiery, underwear, mantles, dresses, and, generally speaking, made-up goods, including other fabrics. A third kind of house will specialize on fancy goods, and add to them furs, hats, gloves, etc., articles mainly of ladies' wear, and, on the other hand,

a fourth type confines itself to heavy goods, and does not touch the fancy goods.

Some of these firms may manufacture the goods they sell, but the majority of them are only merchants ; they buy from the manufacturer, and sell to the consumer, who in this case is the retailer. In a place like Manchester, however, they probably purchase the goods in the raw state, i.e. as grey cloth, and have them bleached, dyed, or finished to their own orders. They thus perform a definite service in the production of the goods as well as being distributors. Again, in many cases, so complex and sub-divided is the trade, a large wholesaler may purchase finished goods from a grey cloth agent, and take them over in the finished state.

If the wholesaler is selling to the retailer, he does so by the machinery of travellers ; a large house in London will have about a dozen travellers, who cover the country, calling regularly on the retailers, and sending their orders to the parent house, wherever it may happen to be. Wholesale houses are found only in the big centres of population, and the chief centres in this country are Manchester and London, with Birmingham, Leeds, Bristol, Cardiff, and Glasgow to a lesser degree. The travellers' orders come through to the parent house, and the percentage of business secured by that means will vary enormously with the house ; but apart from advertising, it is the principal machinery by which a wholesale house in England will secure its trade with the retailer. What the traveller wants is to get " a line " in with the retailers in the hope that there will be regular repeat orders of that line, which will be handled direct between the retail firm and his own house. It is a very common practice to send out " specials," i.e. the regular traveller is covering an area, but at certain times of the year, or if the ground

does not appear to the directing staff of the warehouse to be working satisfactorily, a "special" or additional traveller will be sent out to visit customers, and as a rule he carries certain special lines, which he can offer at a cheap rate and so stimulate trade.

An important point is the general terms of credit. There is no uniform rule, though attempts have been made by discussion between wholesalers to secure uniformity but without success, and the question of credit is a great bugbear. Broadly speaking, the basis of credit is that accounts up to the 19th are due on the 10th of the following month but one, e.g. goods bought up to 19th January are payable on 10th March. Theoretically that is an average credit of two months, but a large number of firms give in addition forward dates of one or two months, which means that the buyer is getting a credit of four months; thus the seller is able to turn his capital over only three times a year. The Irish, Scottish, and Welsh retailers get two months as a matter of course, on everything. It is difficult to say why the Scottish should get this concession, but it is easier to understand why the Irish and Welsh should have it, because, apart from the industrial area in the South of Wales, both these countries are predominantly agricultural, and the movement of money is slow. This question of credit has become so difficult that firms have made different attempts to get it on a good basis. One firm, for example, gives rates of discount, for one month $3\frac{1}{2}$ per cent, two months 3 per cent, and three months $2\frac{1}{2}$ per cent. The rate of discount varies between 3 and $3\frac{1}{2}$ per cent, but in the fancy trade $3\frac{1}{2}$ per cent is the usual rate. Payment of carriage by the seller is now becoming usual throughout the home trade, after a long struggle. That again at current rates is a very serious item.

It may naturally be asked—What function does the wholesale distributing trade perform that in a small country like Great Britain, where there is a large number of manufacturers and retailers, it should be necessary to interpose between them this elaborate system of distribution? There is no doubt that the wholesaler does perform a necessary function. In the first place, the retailer is not a uniform individual or type. An enormous departmental store like Barker's or Selfridge's or Whiteley's in London can afford to have a large number of buyers, and pay them well; and a well-paid and competent buyer can take certain responsibilities himself, so that he does not need the assistance of the wholesaler to the same extent. He may know as much about the trade, and be able to buy quite as large quantities as a wholesaler, and he is justified in getting into direct touch with the manufacturer. On the other hand, it must be remembered first that a retail buyer, who has to superintend the organization of his own department, cannot have time to see about grey cloth too; he must rely on somebody to finish the goods. Secondly, in these big general stores, the tendency is sometimes towards heavy expenditure on buildings, fittings, etc., and the directing staff are very strict on their buyers about the proper turnover of their stock and the profits earned. If a retail department man is going to buy in the grey, remembering that he must have a large selection, and that his money will be locked up in unfinished goods, he may have difficulty in turning over his capital, and that alone is a justification for the middleman. Again, very few retailers are on such a large scale, and 99 out of every 100 do not want to be bothered with buying in the grey and finishing, even if they were able to do so. For the small man who has to do everything, who is his own financier, has to buy and sell himself, and cover a great

many functions which in a large establishment are divided out, there is no doubt that the big wholesale house is very useful. He goes into the place and from one department to another, and can get all he wants. He cannot perhaps buy as keenly as if he went to A for one commodity and B for another, but it suits him better. He gets what he wants, and has only one account.

At the same time there is certainly a tendency to specialize as the community becomes more complex, and it will probably be found as years pass, that wholesale firms will more and more tend to concentrate on individual goods. The general wholesale house will always exist, because of its convenience to the small man ; but the big, well-equipped and well-run establishments will in normal times buy more and more the particular goods they want from those houses which specialize in them.

The times in which we are living are not normal, and how long these abnormal times will continue it is difficult to say. At the moment (1925) it is almost a disadvantage to be a manufacturer. It is quite possible for a merchant who has to buy his goods and finish them himself to sell better than a manufacturer going direct to the retailer. In these abnormal times there is always some man who is being pressed for money—in fact on the verge of bankruptcy—and who will, therefore, take an order at any price to obtain money ; and the middleman, paying cash, can thus obtain bargains, because he is buying from the manufacturer below cost ; and that again is a justification of the middleman.

Another important function which the wholesaler fulfils is that of making a proper assemblage and collection of goods. From the point of view of the retailer this is very important, and it is very difficult for the

manufacturer to make that proper range. It is not so difficult in a simple commodity like a sheeting. Sheeting is a perfectly plain piece of white goods, with different finishes, it is true, but no great range, whereas in fancy commodities the proper variety of range is half the battle. It is very difficult for a manufacturer, who has only his own mill, to produce that variety; and if he does, the distribution of the goods through the agency of travellers soliciting orders, carrying luggage, etc., is very expensive, for the traveller must have a proper range of goods with which to go to the retailer. Suppose a manufacturer of sheeting wishes to deal direct with the retailers, and sends out a traveller, say, to the Clyde district, which is mainly a shipbuilding area, but at the moment very few ships are being built. How is the traveller to pay his expenses, with only sheetings to sell, when his customers do not wish to buy sheets? Unless the traveller has a fairly broad range of goods to show, he will not be able to pick up enough orders from a given ground to cover his expenses. That again is a justification of the middleman.

However one looks at it, production and distribution are separate functions, and unless a man can produce a range of goods sufficient for the requirements of the trade, and unless he is going to have a proper and efficient staff to deal with the credit side of the business, there is no point in going direct to the retailer unless, of course, he can find half a dozen customers big enough to take his product, and that is difficult. It is, therefore, from certain standpoints irrelevant whether the distributor is a manufacturer or not. Take the case of a firm who are spinners, manufacturers, bleachers, and merchants, and who sell direct to the retailer. It is a very unusual combination, and it is very difficult to say whether it is an advantage or not. It is so in some ways but not

in others ; but as far as the distribution of the goods is concerned it does not matter whether they are manufacturers or not. They have to employ the same staff, travellers, counting house, etc., as another firm that does no manufacturing at all.

The one factor that remains is advertising, and it remains to be seen what can be done by this method. One firm may have a particular mark, say, for towels. If they spend large sums of money in advertising, they want everybody to buy that brand of towels. If they are successful, the retailer will be compelled to keep that towel, which means that the manufacturer is selling the article through the medium of the newspaper ; but advertising is exceedingly expensive, and if a firm is going to spend large sums on advertising, and also on soliciting orders through travellers, it is going to be a very heavy burden. It is difficult to say yet to what extent advertising will replace human effort, but it may be assumed that it will not do so altogether. The function of the traveller may be altered ; he may become more a collector of orders. But, again, the range of commodities offered to the retailer and the public is so enormous that it would be impossible to advertise them all. Further, no decent firm or individual goes in for advertising to secure a fictitious profit, or not to give proper service to the community. There are people who advertise quack medicines or other things of no practical value, and thus secure an artificial demand ; but that type of activity has nothing to do with advertising textile commodities in the home trade. In the first place, advertising is so expensive that it must be done with an eye to the future. Consequently the advertiser knows that if the advertising is to be effective, his article must be good value to create a steady demand for it. He knows that if he succeeds in doing that he will be

able to standardize his looms on a small range of commodities. In the old days, before the firm above referred to decided to standardize a particular product, they made a towel and sold it to one customer for whom it would be all right ; then another man came along, who wanted some slight variation, and really there was nothing to choose between the two towels. But under modern conditions to be always changing the looms is terribly expensive ; the producer must specialize and make the trade take a certain standardized product.

There is one other point in conformity with this tendency towards specialization. It is not unreasonable to expect that Manchester will become the centre for cotton goods, Ireland for linen goods, and London for fancy goods. There are a great many linen and fancy goods sold in Manchester to-day, but London will be the place in which the wholesale firms in the City will tend to concentrate on fancy goods. London has the finest retail stores, and fashion stuff is not a thing in which the manufacturer can specialize. Customers may buy the same kind of sheet for ten years, but not the same kind of dress. While it is possible for a manufacturer to make a standard quilt, it is quite impossible to do this in fancy goods.

The hosiery trade is much more important than it was ten years ago, and as it now includes not only socks and stockings, but also underclothing and dress materials, this trade has given a hard knock to Lancashire. If the range of goods produced in the Midlands becomes big enough to cover the selling organization required, we shall find growing up in the Midlands, probably in Leicester or Nottingham, big wholesale houses, who may be manufacturers or not, and who will sell direct to the retailer, instead of as formerly doing their business through wholesalers in Manchester.

THE EXPORT TRADE

It is obviously impossible within the limits of space available here to describe even in the most summary way all or even the largest of Lancashire's foreign markets. All that can be attempted, therefore, is to give a statistical survey of the whole export trade, and then to describe in outline how business is carried on between the Manchester merchant and his foreign customers. Special prominence is given to the South American and Eastern markets, but most of the methods adopted and the problems presented are similar in the other markets of the world.

The tables on pages 185 and 186 give in highly condensed form the main items of the Board of Trade statistics of exports of cotton yarns and piece goods respectively.

ORGANIZATION OF THE EXPORT TRADE

The Manchester shipper is not merely an intermediary between the spinner, weaver, bleacher, printer, etc., on the one hand and the foreign buyer on the other, but a co-ordinator, making the product of all these ready and suitable for the foreign buyer, or, still better, in the American phrase, a "converter." If the Manchester merchant did not fulfil that function, someone else would have to do so, e.g. the manufacturer or bleacher or printer; but if any of these did the work he would obviously have to add to the price of the goods his remuneration for the labour and risk involved and, tending to over-estimate the merchant's profits, he would very likely add too much and fail to get the business. Again, the merchant is able and willing to make an infinite number of combinations of cloth and finish, and his special knowledge of the foreign markets with which he deals enables him to make these combinations in the most

BRITISH EXPORTS OF YARNS
(Millions of lb.)

	1907	1913	1919	1920	1921	1922	1923	1924	1925	1926
Holland	47.7	39.3	40.8	38.4	39.2	61.8	34.2	36.3	50.4	37.6
Belgium	5.5	4.7	9.1	8.7	4.0	5.4	4.4	5.3	5.7	6.7
Germany	67.1	51.9	3.0	5.8	14.9	35.4	25.5	42.8	56.6	33.9
France	7.0	5.0	49.9	15.0	2.5	3.5	4.9	6.8	5.3	8.0
Switzerland	3.2	9.5	8.9	3.3	4.5	8.1	6.6	9.8	8.2	7.8
Rumania	8.5	7.1	4.2	3.7	9.3	0.9	3.9	4.0	4.4	7.5
Turkey	12.1	9.8	5.4	5.7	1.8	1.0	1.3	0.8	0.9	1.1
India	32.3	38.9	9.9	24.3	35.3	38.6	21.3	20.6	16.3	20.9
China	4.3	2.1	0.4	2.7	3.5	6.0	0.5	1.0	0.5	1.7
U.S.A.	7.5	5.4	3.9	9.9	3.1	5.3	5.3	3.3	3.1	3.3
Canada	1.7	3.6	0.7	2.4	1.2	1.9	1.7	1.3	1.1	1.1
All Others	44.2	32.8	26.4	27.6	26.7	34.2	35.5	31.1	36.9	39.0
TOTAL	241.0	210.1	162.6	147.4	145.9	202.0	145.0	163.1	189.5	168.5

BRITISH EXPORTS OF PIECE GOODS

Linear Yards

(Millions)

Square Yards

	1907	1913	1919	1920	1921	1922	1923	1924	1925	1926
Scandinavia	52.3	46.4	118.5	134.5	25.7	71.3	77.0	69.2	65.2	62.7
Holland and Belgium	102.3	115.5	179.2	84.6	61.5	108.6	70.3	87.6	90.9	73.6
Germany	85.9	76.4	51.4	13.8	21.4	114.3	23.0	64.3	130.3	51.9
France	21.4	12.8	116.8	46.7	8.8	42.5	15.7	22.2	18.4	21.4
Switzerland	55.1	79.9	90.2	42.1	46.2	193.6	117.8	197.0	156.1	103.9
Mediterranean States	143.0	108.0	136.6	159.4	98.9	143.1	149.3	132.2	143.3	78.1 ¹
Near East	452.4	401.3	348.6	273.0	178.8	199.5	237.5	218.6	262.9	149.9
India, etc.	2,572.2	3,226.9	828.9	1,497.8	1,152.1	1,480.2	1,518.3	1,726.1	1,546.1	1,667.4
China and Japan	755.0	766.7	315.1	478.7	224.5	330.0	251.6	312.5	184.0	188.3
Indo-China and E. Indies	232.2	364.2	142.0	242.4	175.4	167.6	162.2	171.9	228.3	154.7
Egypt and Sudan	265.7	266.6	185.2	297.1	219.9	211.4	216.2	205.4	237.0	123.9
Other British Africa	162.7	231.2	155.6	187.2	111.2	180.6	199.9	171.2	247.9	194.2
Foreign Africa	131.2	179.6	118.1	93.5	89.0	106.7	108.6	129.6	144.7	123.4
U.S.A. and Cuba	173.2	110.8	60.2	137.0	60.9	102.9	197.7	183.7	102.1	61.6
Latin America	653.6	608.0	264.7	385.2	185.5	303.2	397.3	368.0	444.7	356.6
Canada and British W. Indies	147.0	151.6	31.1	77.5	26.8	58.5	80.8	77.0	72.5	67.5
Australia and New Zealand	204.4	210.7	97.1	176.9	132.6	261.0	209.1	189.7	207.2	213.3
All Others	88.1	118.7	283.1	108.5	83.2	110.7	107.7	117.8	154.1	141.9
TOTAL	6,297.7	7,075.3	3,523.7	4,435.4	2,902.3	4,183.7	4,140.2	4,444.0	4,435.6	3,834.4

¹ Spain, Bulgaria, and Jugo-Slavia included in "Others."

suitable manner for the requirements of those markets. It would be impossible for the manufacturer or printer to have that special knowledge of all markets; their concern is with the manufacturing end of the business. Again, the merchant has very largely to finance the business, which in most cases the manufacturer or printer would be unable to do. This diversity or infinity of combinations has its drawbacks; it increases production costs, and to that extent handicaps us in competition with those countries which standardize. They, it is true, offer a comparatively limited range, but within that range their prices often beat ours. The merchant, both in this country and abroad, is not fond of standardized or branded goods, for it is more difficult to make a profit upon them than upon unbranded goods. Consequently, the middlemen everywhere are inclined to eschew such goods, unless under special arrangements, such as are in force in the home trade, their profits are secured in advance. The accusation, which we so often hear or read in consular reports, that we put obstacles in the way of business by demanding unreasonable minimum quantities, is unfounded and due to ignorance. The facts are the reverse; we make specially quantities which are astonishingly small in view of the difficulties of manufacture, and particularly of calico-printing, and, as stated, these small quantities are bound to increase costs. Our competitors, on the other hand, run a limited though no doubt extensive range, within which there is no need to stipulate any minimum quantity, but their production is based on a very large output for each quality and design or colour. On the whole, however, we gain more than we lose by this diversity and adaptability.

Orders. In theory the Manchester shipper does not place an order with a manufacturer unless he is able at

the same time to book an equivalent order from a customer abroad ; but in practice, at any rate in the South American trade, he very often buys without a definite order before him, or in excess of such order. He does so for various reasons—to get a lower price by buying a larger quantity, to get a larger assortment than would be possible if only a small order were placed, or to be in a position to deliver more quickly than if the operation had to start from the beginning on receipt of the order from abroad. This last is the answer to the argument with which we are so often confronted, that orders placed in the United States which have the advantage of being nearer to Central America and the north of South America, are delivered much more quickly than those placed in England. These purchases, then, may be regarded as anticipatory, but, generally speaking, they are *not* made in advance with the view of getting an extra profit owing to a subsequent rise in prices. Naturally one would try to avoid making purchases of this kind in a falling market, but the possibility of an enhanced profit is the least of the reasons for departure from the theory described.

Every purchase is an act of volition, but there is a great difference between the usual Eastern and Western order placed in Manchester, in that the latter depends upon the will of the man in direct touch with Manchester, whereas the former depends upon the will of the man one stage farther off. The history of an Eastern order is something like the following : The native dealer offers to a Bombay merchant 20 rupees per piece for 50 cases of white shirtings, to be delivered in August. The Bombay merchant converts the price into sterling at the rate at which he can cover his exchange for August, subtracts the duties, etc., and his profits, and cables his offer of so many shillings and pence per piece to

Manchester. The Manchester merchant makes a similar calculation, but he has not to take the exchange into consideration. He knows the cost of freight, insurance, packing, tickets, etc., and bleaching, thus finding how much is left for cloth and profit; he makes his offer to the manufacturer accordingly, always, of course, bearing in mind the important matter of delivery. Finally, often after numerous cables backwards and forwards, the order is booked. If everything goes according to programme, the Manchester merchant and the Bombay merchant make the profit which their calculations told them they would make. Many inquiries do not lead to business, and further inquiries follow, perhaps addressed to other merchants, the total volume of which is apt to give a false idea of the total volume of business offering, because if the first inquiry had led to business, the second would not have been made. The normal South American order, on the other hand, is placed by the South American merchant in Manchester when he thinks the time opportune for goods which he thinks he can sell, but he does not take any steps to sell them until he has actually got them, or at least advance patterns of them, in his store. He cannot become "dormie" on the transaction by covering the exchange, because, though he may know when he will have to pay, he does not know when he is going to be paid, and so it is just as speculative for him to cover the exchange as not to cover it. This shows how unsatisfactory violent exchange fluctuations are to the shipper's client, and thus indirectly to the South American shipper himself.

Another difference between the Eastern and the Western trade is that prices in the former case are nearly always "c.i.f.," whilst those in the latter are usually "loco. Manchester" with making-up, packing, freight, and insurance charged as separate items. In any

case the buyer has to pay for all these things ; it is just a matter of custom. Again, the Eastern trade is almost invariably done on cash terms, cash against documents either in London or abroad, but occasionally " documents against acceptance," while the bulk of the South American business is done on open credit terms, normally six months ; the documents go direct to the South American buyer, and he remits direct to Manchester. One may assume that in practice these various methods and terms have proved satisfactory, and that the profits have been commensurate with the risks ; for, if not, the necessary adjustments would have taken place.

Warehouses. There are two kinds of Manchester export warehouses, (1) the majority, in which the making-up, packing, and dispatching of the goods is done by the landlord of the packing house for his shipper tenants, of whom there are often many under one roof, and (2) those in which the shipper fulfils all these functions himself. It cannot be said that the larger firms do their own packing, and that the smaller are in packing warehouses ; it depends upon the nature of a business which method is found more suitable. Where there are sudden spurts, as in the Eastern trade at the end of the month, or seasonal fluctuations, or where the shipper deals with one market only and may, therefore, find himself very slack if that market happens to be inactive, a packing warehouse may be more convenient. But if business can be spread out pretty evenly through the year, then the other method may recommend itself. If the shipper does his own making-up and packing he is able to secure for himself some of the profit which otherwise he would pay to the packer ; on the other hand, he has bigger fixed overhead charges. Also there is naturally more work and responsibility in connection with organization, staff, etc., if the shipper has his

own warehouse than if he is a tenant in a packers' warehouse.

Whatever his warehouse arrangements may be, the shipper must have a staff of his own to examine his goods, and that not only in their final state before dispatching them; he must examine the grey cloth before sending it out to be bleached, dyed, or printed, and again when it comes back. It would, perhaps, seem more economical if the cloth were sent straight from the manufacturer to the bleacher, dyer, or printer, but there are various reasons why this is the exception rather than the rule. The merchant does not wish the manufacturer to know to what finisher he intends to send his cloth, nor the finisher to know from what manufacturer it comes. If he does not detect faults in the grey cloth until it is returned to him finished, he runs the risk of falling between two stools, each party contending that the fault is with the other. Again, very often the merchant does not know, when the grey cloth is delivered, exactly what he is going to do with it. He is often bound to take smaller deliveries than he can utilize—this applies especially where it is a question of print assortments or of assorted cloth designs. Neither the manufacturer nor the finisher would, under normal circumstances, be prepared to make any concession in price if he were saved the trouble of calling for his cloth in Manchester, for he would say that his arrangements provide for this, and, so far from saving him anything, it is upsetting them. When the cloth is returned from the finisher (the term is used here to include bleacher, printer, and dyer), it has to be examined again and damages, if any, cut out; this seldom applies to bleached goods, for the price of bleaching includes making-up, and the bleacher himself cuts out the damages. The long pieces or lumps have to be cut into shorter "ends" of the

requisite length and folded in the manner prescribed or usual for the particular market. The pieces are then ticketed and/or stamped, partly to mark their length, partly so that they may bear some name or number to facilitate their sale, and for future reference. The packing, too, is a matter of importance. Some countries take their goods in cases, others in bales. Cased goods open out better, but cases cost more than bales, and being more bulky pay more freight. They are also more exposed to pilferage though less exposed to hook damage. In some countries there is more use for empty cases; in others for the wrapping of bales. In most South American markets the duty is levied on the gross weight, which makes bales essential.

Pattern-card work is another important feature. There are so-called speculation patterns intended to induce orders; there are the sale cards which accompany shipments, which serve the same purpose for the recipient of the goods, to induce his customers to buy. Finally, there are the small reference patterns, which have to be retained here, because although one's books contain the full record of cloth particulars, make-up, etc., one must have actual cuttings to show designs, finish, etc.

Qualifications for the Export Trade. There is no need to enlarge upon the fact that, in addition to a knowledge of goods, one should know as much as possible of the countries to which one wishes to sell them, their customs, languages, climatic conditions, tariffs, politics, currency, and last, but not least, the character and psychology of one's customers. The Manchester shipper is a specialist in distribution, and his success and ability to hold his own, though due primarily, of course, to the fact that he is able to deliver the right goods, and does so, is also due to his appreciation of these other factors.

THE INDIAN AND EASTERN TRADES

As will be seen from the tables on pages 185 and 186, the Indian and Eastern markets are by far the largest section of Lancashire's export trade. Before the war India and the East took about 62 per cent in volume of our total exports, which meant not far short of 50 per cent of our total production.

The reasons for the enormous consumption of cotton goods in these countries are obvious. In the first place, their population is enormous, amounting altogether to fully half the world's total. Again, the climate makes cotton the most suitable clothing, except silk, but that is too dear for most of the poorer inhabitants of the East, China being the only country in which silk is not regarded as a complete luxury. It must be remembered, however, that in these semi-tropical countries clothing is to a certain extent a luxury, or at least a sign of prosperity, rather than a real necessary, and the purchase of new clothing is generally associated with special occasions such as weddings or religious festivals. Again, the enormous variations of climate require very diverse provision of clothing, varying, for example, in India from the Punjab which has a real "cold weather" to Madras, where the climate has been aptly described as "three months hot and nine months hotter." Again distinctions of race and caste are generally marked by distinctive clothing. For all these reasons, therefore, the variety of fabrics required by the Eastern markets is almost unlimited.

It is a popular misapprehension, however, that the Eastern trade is mostly confined to heavy goods and cheap cotton fabrics. In 1923 the Board of Trade published¹ a very interesting analysis of the weight and value

¹ *Board of Trade Journal*, 27th September, 1923, page 322.

of piece goods exported in 1922, and in the following table a few details are extracted from that table relating to India and China, with some other countries for comparison. In this table the comparative weight of the goods is indicated by the figures of weight in hundred-weights per thousand square yards, while the quality

WEIGHT AND VALUE OF PIECE GOODS EXPORTED IN 1922

	GREY		WHITE		PRINTED		DYED		COLOURED	
	Cwts. per 1,000 sq. yds.	£'s per cwt.	Cwts. per 1,000 sq. yds.	£'s per cwt.	Cwts. per 1,000 sq. yds.	£'s per cwt.	Cwts. per 1,000 sq. yds.	£'s per cwt.	Cwts. per 1,000 sq. yds.	£'s per cwt.
India . . .	1.49	13.1	0.99	21.5	1.41	24.7	1.66	21.9	1.79	24.7
China . . .	2.28	11.8	2.35	14.6	1.93	25.1	2.71	28.2	2.40	27.2
W. Africa . . .	2.89	11.0	1.91	17.0	1.80	27.6	2.30	18.8	2.33	20.4
S. America . . .	2.42	11.7	1.80	18.8	1.61	25.7	1.99	25.5	2.05	22.7
Australia . . .	3.23	14.0	2.12	20.3	1.99	27.6	2.44	24.6	2.31	23.2
Europe . . .	1.57	17.9	1.67	21.8	1.73	30.0	2.23	31.2	1.98	30.4
U.S.A. . . .	1.53	31.1	1.72	35.2	1.92	31.3	2.17	33.6	1.62	36.6
Average for All Countries . . .	1.64	14.5	1.62	18.4	1.67	25.0	2.17	25.6	2.06	24.5

of the goods may be inferred from the figure of £'s per cwt., i.e. their value in proportion to weight. From this it appears that in all the different varieties of piece goods mentioned in the table, India is nearly always the lightest, which is natural, and the average value is just about the same as the average of our export trade as a whole. The China trade is much heavier, but only certain sections of it are cheap. An interesting comparison is with the figures of West Africa and the U.S.A. For the former the figures of weight are very high, and of value very low, while in the U.S. the position is almost exactly reversed, for in every section the value figures are the highest.

But perhaps the most striking characteristic of Eastern

markets is the extreme variation of the volume of the trade. That again is natural, because in all these countries the main source of demand for foreign manufactured goods must inevitably be their own agricultural production, for it is only with the export surplus of their crops that they can pay for manufactured goods. In India particularly the whole fate of each season's crops depends almost entirely on the monsoon (in spite of greatly increased irrigation), so that India's effective demand for Lancashire goods in each season is closely related to the character of the monsoon. India is essentially a poor country with heavy annual charges to meet abroad for interest on past borrowings, for administrative purposes, and for imported silver, for it is one of the paradoxes of the situation that India, which is one of the largest silver-using countries in the world produces no silver at all. She must, therefore, have a favourable balance of trade, i.e. a surplus of exports in any case to meet these charges, and if she is to import substantial quantities of manufactured goods from abroad, the excess of exports of her own products must be correspondingly greater.

In India, however, the position with regard to the import of cotton goods is further complicated by the fact of her large home production. As will be seen from the table on page 169, India now has over 8,500,000 spindles in her cotton factories. But in addition to these there is a purely domestic consumption by hand spinning which amounts to a substantial figure. No data are available for any real estimate of the amount of cotton consumed in this way, and a purely nominal figure of 750,000 bales per annum is taken in Government statistics. In the following table is given a condensed summary of India's imports of yarns and piece goods, and also her home mill production of both. With regard

COTTON PIECE GOODS IN INDIA (Millions of Yards)

	1913-14	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27
<i>Imports from—</i>									
U.K.	3,204.4	962.6	1,277.5	947.4	1,440.6	1,306.4	1,598.7	1,275.0	1,457.3
Japan	9.6	76.0	170.3	90.3	107.8	121.9	153.3	216.8	243.5
Others	83.1	25.0	43.5	42.4	28.9	38.6	36.5	48.2	66.0
TOTAL	3,197.1	1,063.7	1,491.2	1,080.1	1,577.3	1,466.8	1,801.4	1,540.0	1,766.8
Indian Mill Production	1,164.3	1,640.0	1,580.9	1,731.6	1,725.3	1,701.6	1,970.4	1,954.5	2,258.8
Total Supply	4,361.4	2,703.7	3,072.1	2,811.7	3,302.6	3,168.4	3,771.8	3,494.5	4,025.6
<i>Less Exports</i>	151.3	285.3	207.4	234.6	231.6	226.4	235.8	200.3	226.4
Retained	4,210.0	2,418.4	2,864.7	2,577.1	3,071.0	2,942.0	3,536.0	3,294.2	3,799.4

COTTON YARNS IN INDIA (Millions of lbs.)

	1913-14	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27
<i>Indian Mill Production—</i>									
Nos. 1-20	492.7	431.2	443.4	470.6	478.6	411.9	469.8	444.8	515.7
" 21-30	167.0	183.7	199.1	203.2	209.0	182.0	223.8	213.8	248.4
" 31-40	19.7	17.1	15.0	10.9	13.9	19.7	19.4	19.7	27.7
Over 40	2.7	3.6	2.1	2.4	2.2	3.3	5.8	5.8	11.6
TOTAL	682.8	635.8	660.0	693.6	705.9	617.3	719.4	686.4	807.1
Imports	44.2	15.1	47.3	57.1	59.3	44.6	55.9	51.7	49.4
Total Supply	727.0	650.9	707.3	750.7	765.2	661.9	775.3	738.1	856.5
<i>Less Exports</i>	198.9	154.8	82.8	81.6	58.3	40.0	37.3	32.9	42.4
Retained	528.1	496.1	624.5	669.1	706.9	621.9	737.8	705.2	814.1

to the yarn imports it should be noted that these are very largely used for domestic consumption in hand looms, i.e. not in the power factories. The yarns produced by the latter are mostly of low counts, and as will be seen from the table are not changing much relatively, though the total figures for 1926 showed an increase of 18 per cent on 1913. With regard to piece goods the home mill production is increasing steadily, and since 1919 the former position has been reversed, and imports are now less than home production. The important point, however, is that India's total consumption both of imported and of home-made goods is well below pre-war; indeed, the table gives a very good idea of the upheaval caused in India by post-war conditions. Space will not allow of a detailed examination of the question, but there is a great deal of evidence to support the contention that India's consumption depends largely on her capacity to pay, and that if the general level of prices of cotton goods is high the volume of her demand is necessarily restricted.

Another factor which gravely affected the volume of India's imports of cotton goods in pre-war days was the fluctuation in the price of silver, with the consequent effect on the rupee exchange. After the stabilization of the rupee at 1s. 4d., however, say about 1896, this difficulty was removed; but during the war the gold standard exchange system inevitably ceased to operate, and the wild fluctuations of silver, especially in the post-war period, again caused terrible dislocation in Indian trade. The difficulties were, of course, increased by all the other consequences of the war in the way of interference with trade, including the shortage of shipping. During the brief post-war boom when India's favourable balance of trade reached enormous figures, the lack of shipping and the impossibility of getting goods from

Europe prevented her taking full advantage; and the boom was very quickly followed by the deflation slump, which hit India very badly indeed, and for a time the visible balance of trade was actually against India. Now, however, that world conditions are gradually returning to something more like normal, and especially since the rupee has once more been stabilized at the new level of rs. 6d., it may be hoped that India's consuming capacity will recover to at least pre-war dimensions.

But the question remains, who will supply that demand? In the first place her own mills, as already shown, are able to cover an increasing proportion of the home demand, and the policy of protection of Indian industries, which has been definitely adopted by the Indian Government, will be a strong influence in that direction. It would serve little purpose to go into the question of the Excise Duties, which for so long formed a bone of contention between India and Lancashire, for they are now finally abolished; and as the import duty on cotton goods remains at 11 per cent the protection is material and may be expected to lead to continued expansion of the Indian industry. As a matter of fact, however, the competition which is most feared in India is not that of Lancashire but of Japan, because Japan is producing the cheap goods which India wants, and which Lancashire cannot supply. The most interesting question, however, is the raw material out of which these cheap goods are to be made. During the scarcity of American cotton not only India but also China and Japan have shown how much they could do in developing the use of local native cotton. Japan particularly is most favourably placed to switch over from American to Indian whenever relative prices are favourable; and in 1926-27 this operation was most strikingly reversed, these countries taking enormous

quantities of low grade American cotton, which was then cheaper than it has been since pre-war days, and relatively much cheaper than Indian cotton.

Apart from American cotton, the East generally uses very little imported cotton. India has at times shown some tendency to use Egyptian in her finer mills, and during the war there was a very interesting development in the use of considerable quantities of Uganda cotton in the Indian mills. But on the whole the bulk of the production of the Eastern mills taken altogether is still on the low side, at least compared with that of Lancashire. The result is that Lancashire should still be able to hold her own even in the East in these finer goods, especially those made from Egyptian cotton, so that it is not too optimistic to hope for some recovery in the better class of Lancashire's exports to the East, though it is very doubtful if she will ever equal the pre-war volume of her exports of the heavier goods.

In China conditions are in some respects very similar to those in India, but in others very different. Like India, China has her own native cotton crop, her own cotton factories, now containing nearly $3\frac{1}{2}$ million spindles, and her own purely domestic consumption, which is probably much larger than in India. China, also, is much nearer to Japanese competition than India. Like India, China's capacity to purchase foreign textiles depends largely on her exports, but she has not the advantage that India enjoys of a stabilized exchange, so that the effects of the fluctuations of the price of silver are more severely felt. In recent years China has, of course, suffered very seriously from political convulsions which seemed to be coming to a head in the events of the spring of 1927.

A few points of detail with regard to the methods of our trade with India may be noticed. To a large extent

the import trade in India is passing into the hands of Indian houses who have learnt the business from the large European firms (mostly British) who formerly carried it on. Some of the finest people in the Indian trade are numbered among these Indian firms, and their financial standing is very high indeed.

To a large extent the initiation of orders from India to Manchester is under the control of Indian bazaar dealers, who give their orders to banyans or salesmen employed by the importing firms, on what is known as the indent system. An indent is an order, and such orders for piece goods are generally fixed up by telegraph, the cost of which is so high per word that an elaborate code system has been evolved. The first figure codes were somewhat complicated, and it was necessary to have a large and highly experienced staff of code clerks trained in the working of these codes, and as the cost per word declined it was found better to make these codes simpler. The making up of such a telegram cannot be left to an Indian clerk, but has to be done by the principal, and after a strenuous day's work, these elaborate codes were awkward to work. There is now an international convention which allows five letters making one code word to represent a whole phrase. A new rate has also been introduced, viz., the daily letter telegram at quarter rate with a minimum of forty words, and the time taken in transmitting under this system is about twenty-four hours. There is also an urgent rate, which is three times the usual.

Indents or orders may be classified as pro-forma and confirmatory, the latter being an indent by wire, confirmable by mail. Pro forma indents would be sent for a new style.

There is a considerable business worked by a few large firms importing regular lines of standard cloth,

which can be bought from stock or "to arrive" within a short space of time. This is a branch of trade requiring large capital resources, great experience, and branches in India. Joint account transactions also take place, but are not numerous when compared with the whole.

If an importer in India arranges a large order with his dealers and suppliers, the only safe way is to buy exchange from an exchange bank, so that when the bill arrives he will know exactly how many rupees it will take to pay for the amount in sterling.

Shipments to initiate fresh articles or new cloths are sometimes made on consignment, but the prices obtained do not encourage such ventures. If Manchester houses were to consign on their own account large shipments which were sold at a profit, they would soon send a lot more, and the Indian buyers would never be able to know what goods were coming out and whether the market would not be glutted and so, in self-defence, they band together and give poor prices.

Indents are divided into the following categories, and with the exception of "ex-go-down" warehouse terms, are done in sterling and exclusive of customs duties, as sterling conversions are more conveniently arranged in India.

(a) *C.I.F.* provides for (1) the cost of the goods, including making-up, packing in packages suitable for export—bales of paper, canvas and tarpaulin, bound under hydraulic pressure, with iron or steel hoops; or wooden cases, generally lined with hermetically sealed tinplates, and bound round with thin hoops nailed round the edges and middle, (2) insurance, which covers marine insurance, risks run at sea by loss of ship, fire, or water damage, etc., and during the war insurance against war risks was generally included, and (3) freight or cost of

the carriage by sea, from the port of embarkation to the destination.

(b) *C.I.F.I.* In this case interest is added from the date of shipment to that of payment, i.e. to the due date of the bill, when the goods are drawn against.

(c) *C.I.F.C.I.* is similar to (b), but an agreed rate of remuneration is included for the importing firm.

(d) *Harbour Terms.* It will be understood that the shipper or merchant on this side has performed his functions when, under a c.i.f., c.i.f.i., or c.i.f.c.i. contract, he has paid for the cost, insurance, and freight of the goods forwarded in the time contracted for, and that his reimbursement is due irrespective of the arrival of the goods, the recovery of the loss, if any, in case of accident, etc., from the insurance company, being the concern of the importer. Under harbour terms, however, the shipper is responsible for arrival, and must himself recover the loss for non-arrival, if any, from the insurance company.

(e) *F.O.B.* terms are also used, but not generally.

The Indian buyers require the greatest precision in the execution of orders in every particular, quality, finish, dimensions, assortment of the cloth designs, shades or patterns, and are meticulous about the time of shipment not being exceeded, with statutory penalties or option of cancellation in instances of late shipment. The practice of having an agreement or contract which contains a most carefully prepared list of conditions regulating the whole transaction is generally followed. This contract defines the rights and responsibilities of either party in case of default or irregularity.

Chambers of Commerce in India perform a useful service in providing the machinery for the settlement of disputes by surveys. They provide a means for laying down equitable statutory stipulations, agreed upon by

both sides, and furnish a useful avenue of approach by traders for collective negotiations.

Sometimes when goods are late the cause may be carelessness, and then the shipper has no redress. In some markets in India a month's latitude is allowed if the shipper can prove *force majeure*. In Calcutta, and in Bombay and Karachi no latitude is allowed in regard to time, but they take the option of the penalty or of returning the goods. Generally speaking, shippers have been able to arrange to have special care given to Indian orders, so that they are executed promptly.

As to Manchester's trade with China, the chief peculiarity is the fairly common use of the method of consignment, shipments of goods being sent out more or less on speculation and sold at the periodical auctions, e.g. at Shanghai.

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(Part of the section on the Indian trade was founded on a lecture by Mr. J. H. Rodier.)

References.

International Cotton Bulletin (Quarterly since September, 1922).

Board of Trade. *Annual Statement of Trade; Accounts relating to the Trade and Navigation of the United Kingdom.* (Monthly.)

Report of the First Census of Production of the United Kingdom (1907). Cd. 6320.

Government of India. *Review of the Trade of India* (Annual); *Monthly Statistics of Cotton Spinning and Weaving in Indian Mills.*

CHAPTER V

COTTON TRADE ORGANIZATION

EMPHASIS has already been laid on the fact of the enormous size and world-wide extent of the cotton industry, which has led naturally to its becoming extremely complex and highly specialized; but perhaps the outstanding feature of the trade is the extent to which organization has been developed in every section of the industry. It is an interesting fact that the organization of employers and workmen in the English cotton industry for industrial purposes is one of the oldest and probably the best of any industry, and the Brooklands Agreement of 1893 is an outstanding example of what can be done in preventing disputes by really efficient organization both of masters and of men. It is probably not claiming too much to say that it was from this end of the industry that the idea of organization spread backwards through the cotton trade. Certainly the work of the International Federation, which grew out of the English Federation, has done a great deal in spreading the idea of organization throughout the cotton world, while the British Cotton Growing Association has played a similar part in advocating agricultural organization throughout the British Empire in particular. In this chapter, therefore, an attempt will be made to enumerate the most important organizations which exist throughout the industry, and to describe very briefly the work of a few typical examples in each section.

Beginning with cotton-growing countries, the first development to be mentioned is, of course, that of the

Government Departments of Agriculture, which are now found in almost every cotton-growing country. This of itself is one of the most remarkable developments of the present century. Until a few years before the war Departments of Agriculture either were non-existent or were of the most sketchy character in every country, except perhaps the United States. Now practically every cotton-growing country has an important section of the Department specially devoted to cotton, with, in many cases, special arrangements for research work, while the establishment in 1922 of the Imperial College of Tropical Agriculture in Trinidad, and the work of the Empire Cotton Growing Corporation are the best evidence of the determination of the Governments of the British Empire to give cotton growers every assistance that scientific knowledge can provide.

The work of the British Cotton Growing Association has already been referred to. Its foundation was largely the work in the first place of the late Sir Alfred L. Jones, whose interest in the West African trade as a member of the Liverpool firm of Elder Dempster & Co. led him to take up the question of cotton growing in our African colonies. The first step was taken at the annual dinner of the Chamber of Commerce at Oldham (the chief home of the spinning of American cotton in Lancashire) in January, 1901, when, on the suggestion of Mr. Benjamin Crapper, a committee was appointed to make inquiry into the possibilities of growing American cotton in other countries, and particularly in the British Empire. The committee's report, published in November, 1901, was favourable; and on 18th February, 1902, the matter was further discussed at a representative meeting held at the Manchester Chamber of Commerce, when an influential committee was appointed. In the meantime Sir Alfred Jones had, in May, 1901, sent out

10 tons of American seed to the West African colonies. On 7th May, 1902, Mr. J. Arthur Hutton, acting as Chairman of the West African Committee of the Manchester Chamber of Commerce, invited Sir Alfred Jones and some of the leading West African merchants to dinner at the Albion Hotel, Manchester, and at that dinner the British Cotton Growing Association was born. At a general meeting of the various associations and other bodies interested, held at the Manchester Chamber of Commerce on 12th June, 1902, the Association was formally inaugurated, Sir Alfred Jones being elected President, and it was decided to raise a guarantee fund of £50,000. A fair response was made to the appeal for funds, considerable subscriptions being received from the organizations representing the cotton operatives, as well as from the employers.

The Oldham Committee had already, through the Colonial Office, instituted inquiries into the possibilities of cotton growing in certain of the colonies, and these were now followed up by consignments of seed and machinery to various countries which had been pointed out as suitable for experiment, and by grants to planters and others, while experts were sent out to different parts of the British Empire to inquire into their possibilities. The results were so satisfactory that, in November, 1903, it was decided to increase the guarantee fund to £100,000. At this stage the matter suddenly acquired increased importance from the peculiar conditions of the cotton market, due to Sully's corner. Under these circumstances the British Cotton Growing Association decided to increase their capital to £500,000. A Royal Charter was granted to the Association on 27th August, 1904, and practically the whole of the capital of £500,000 was ultimately raised.

The Association has never been run on profit-making

lines. Up till the war their work had consisted mainly of inquiry and experiment, and by a process of elimination the chief field of their operations had been narrowed down to a comparatively small number of countries in which substantial success was already in sight. The war proved a very severe test of the Association's methods and organization, while the slump in prices which immediately followed proved an equally severe test of their financial stability. Their policy of guaranteeing the highest possible prices to the grower involved great risks of loss when prices fell; and as it happened the Association had to intervene in Uganda, which had until then been left to private agencies. These, however, could not face the strain of the slump, and the British Cotton Growing Association, acting in conjunction with the Uganda Government, stepped in and took over a large part of the crop. Fortunately the turn in prices came in time to save them from the threatened loss.

Though their staff was severely depleted by the war they managed to carry on and held most of the ground; but the post-war slump of 1920-21 again threatened the very existence of the work. Once more, fortunately, the strain was short-lived, and in the subsequent years of high prices the Association for the first time reaped a substantial profit from their work. But the renewed fall of prices in 1926-27 again brought them face to face with the problem of paying guaranteed prices on a falling market. Their work now extends to the Gold Coast and Nigeria in West Africa, Uganda, Kenya, Tanganyika, Nyasaland, Rhodesia, and South Africa, as well as the Sudan, Mesopotamia, Australia, and the West Indies.

In addition to the valuable assistance they render to cotton planters in all these countries not only in the form of supplying selected seed, often without charge, but

also by obtaining for them every kind of machinery and equipment from home, they also act as their agents in the sale of their crop in this country. They have from time to time contributed largely to the financing of ginneries, etc., in new districts, and, generally speaking, have made it their business to assist the planters in every possible way in what may be called the commercial end of the business.

This is perhaps the most convenient place to refer to the work of the Empire Cotton Growing Corporation. In 1916 the Board of Trade set up a Committee to consider the position of the textile trades after the war, and both the British Cotton Growing Association and the International Federation in their evidence before that Committee stressed the unsatisfactory position of the world's supplies through their dependence on the vagaries of the American crop. Largely as the result of this evidence the Committee recommended the appointment by the Board of Trade of a special Committee to go into the whole question of Empire supplies. This Committee was appointed in 1917 and spent over two years in making a complete survey of the question. An Interim Report was presented in 1919 (Cmd. 523), and after considerable negotiations the Empire Cotton Growing Corporation was formed, with a capital grant from the Government of £1,000,000, and the annual revenue to be provided from a cess of 6d. a bale on all cotton imported into England. It was at first intended that this cess should be voluntary, and a very large majority of spinners agreed to pay it, but later it was found desirable to have legislative sanction, and an Act was passed in July, 1923. Since 1921 the Corporation has been at work in practically every cotton-growing area of the Empire, and has rendered invaluable assistance, first by obtaining a series of reports by experts on the position

in the different countries, second by co-ordinating the work being done by various agencies, Government and otherwise, and third, by giving direct financial assistance where required, especially in providing additional staff for cotton work. In 1926 they established a special research laboratory for cotton problems, located in Trinidad for the sake of co-operation with the Imperial College of Tropical Agriculture there. The Corporation also publishes a quarterly Journal—*The Empire Cotton Growing Review*.

Turning now to other organizations of the planters themselves in cotton-growing countries, there has been in America a succession of associations which had for their object the defence of the planters' interests. The Farmers' Educational and Co-operative Union and the Southern Cotton Association date from the early part of the century, but the latter had but a brief existence, and the principal association of the kind now is probably the American Cotton Association. In recent years there has been a very marked development of growers' co-operative associations in America with a powerful central organization known as the American Cotton Growers' Exchange. There is also a body known as the American Cotton Shippers' Association, which looks after the interests of the merchants and shippers, including such questions as arbitrations. As to other organizations connected with the sale of raw cotton, the principal cotton exchanges in America are those of New York and New Orleans, though another was started in Chicago in 1926. There are also spot markets in many large towns throughout the cotton belt, but New York and New Orleans are the principal futures markets, and the establishment of both dates back to the time (about 1870) when that class of business came into existence, their charters being dated 8th April,

1871, and 19th September, 1871, respectively. Both these exchanges publish large quantities of statistical materials affecting the cotton trade.

The establishment of the Liverpool Cotton Association in 1882 by the merging of the two then existing organizations, namely, the Liverpool Cotton Brokers' Association, which dated from 1841, and the Liverpool Cotton Exchange, has already been referred to; and much of the work of the Association has been described incidentally in the chapter on the Liverpool Cotton Market, particularly as regards the various forms of contract, spot and futures, and the system of arbitration and appeals. official appeal committees for the respective growths of cotton are appointed each year from amongst the members of the Association, and the members of these committees sit daily and adjudicate upon the various qualities and growths of cotton which come before them.

The Liverpool Cotton Association standards of cotton are known throughout the world. In 1923, by agreement with the United States of America and various European Exchanges, one form of universal standards for American cotton was agreed upon; and therefore after being in existence for several generations, the Liverpool standard for American cotton is no longer known by that name. There are, however, Liverpool Cotton Association standards for every growth of cotton quoted in the Liverpool official circular, which is issued daily and weekly, giving the current prices for various grades and growths, and it is on the basis of these standards that the great volume of the business is conducted. The Association is prepared to make up standards for recognized cotton exchanges throughout the world, but it has been found impracticable to make up standards for individual firms requiring them.

Reference has already been made to the daily and weekly circulars published by the Association which, in addition to prices, contain most of the available statistics regarding cotton movements, stocks, etc. The *Annual Circular* contains a corresponding record of the season's statistics.

The Manchester Cotton Association was founded in 1894 as part of the attempt to create an independent Cotton Market in Manchester, when the construction of the Ship Canal created the Port of Manchester. At the present time there are direct lines of steamers running to Manchester from the various cotton ports in the United States of America, Alexandria, India, Australia, etc. A considerable amount of import business is done direct to Manchester, especially in Egyptian cotton, but the proposal to establish a futures market has not yet materialized. In general working the Manchester Association follows closely the rules of the Liverpool Association, but with the difference that while the governing body of the Liverpool Association consists solely of merchants and brokers, who make all the rules and by-laws, the Manchester Association is composed of merchants, brokers, and spinners; the President, elected annually, is alternately a spinner and a merchant, and all classes have an equal voice in the making of the rules. The Association publishes a weekly journal, mainly statistical, called *Cotton*.

Returning now to the Departments of Agriculture, we find that the part of their work in which the cotton markets of the world are most interested is the publication of reports on the progress and prospects of the growing crops. As the crop reporting system of the United States Department of Agriculture has been to some extent the model of similar systems in other countries, and that system has in recent years been the

subject of much criticism, a brief account of it may be inserted here.

The authorities responsible for the various reports are : (1) the Department of Agriculture, including (a) the Bureau of Agricultural Economics, Crop Reporting Board, (b) the Weather Bureau, and (c) the Bureau of Entomology ; and (2) the Department of Commerce, Bureau of the Census. The Department of Agriculture is responsible for all the reports on the progress of the crop, while the Bureau of the Census deals with the actual ginning of the crop.

Up till 1915 the crop reports consisted of a series of monthly reports throughout the growing season, as at the 25th of each month from May to September, each report being published about the 1st of the following month. The reports consisted merely of a percentage condition figure of an imaginary "normal," which was neither a maximum nor an average but a "full" crop. In 1915 the Department, having accumulated a large amount of data concerning the relation between the condition reports and the final outturn of the crop, began to publish with each monthly report from 25th June onwards a crop "forecast" founded on a system of "par values" which represented for each date the probable 100 per cent yield to which the actual condition figure at that date could be applied. It was clearly stated that these forecasts did not imply any estimate of the final crop, but were merely an arithmetical interpretation of the state of the crop at the time. The markets, however, persistently failed to pay adequate attention to this distinction, and the fact that the crop forecasts were materially changed every month (as was inevitable), and were in many cases very far from proving to be correct estimates of the final crop figure, was the cause of much misunderstanding in the cotton

trade. In 1924 the reports were made fortnightly from 1st August, and the dates changed to suit those of the ginning reports (see p. 214); and as it happened that during the next three seasons the unexpectedly favourable development of the crop, resulting from the reduced damage by weevil, made the early forecasts fall very far short of the ultimate crop, the whole trade broke out into protests against the increased frequency of the reports. The result was a campaign in the American Legislature in 1926-27, the upshot of which was that all the reports before the beginning of August were abolished, except the acreage reports.

As a matter of fact the acreage reports themselves were sometimes responsible for a good deal of the discrepancy between the forecasts and the final outturn of the crop. The first estimate of acreage "planted and in cultivation as at 25th June" had for many years been published with the condition report as at that date, and no further acreage figures were available until December, when the estimated acreage planted received preliminary revision and a first estimate of acreage harvested was published. Both these figures were finally revised in the following spring, the results being published with the first condition report as of 25th May. For some time prior to 1927, however, earlier estimates of acreage abandoned had been published, which in effect were estimates of acreage harvested; and in 1926 a preliminary estimate of acreage harvested, based on the average abandonment of the previous ten years, was published throughout the season. Under the 1927 Act the first estimate of acreage "in cultivation as of July 1," was fixed for 9th July, and that of acreage abandoned after 1st July for 8th September, both being followed by later revision on 8th December, while the publication of the final revised figures of acreage, both

planted and harvested, was brought forward to 17th May of the following year. In 1921 the first estimate of acreage planted proved to be very seriously underestimated, and in subsequent years the Department made great efforts to improve the system of compiling the estimate. Since then it is notable that in practically every case the revision during the season of the acreage planted has always been upwards, while at the same time every year has marked a large increase of the acreage figures over those of the previous season.

The ginning reports published by the Census Bureau are roughly fortnightly from 1st August to 16th January and the final ginning report on 20th March. The Census Bureau also publishes monthly statistics of the consumption in the American cotton mills, and of stocks in mills and public warehouses at the end of each month. The latter are the only statistics of mill stocks available except the half-yearly publication of the figures of the International Federation, and by adding them to the visible supply figures published by the New York Exchanges and the Liverpool Cotton Association it is possible to follow the movement of the world's carry-over of both American and Egyptian cotton, to an extent which represents about 60 or 70 per cent of the total, during the intervals between the publication of the Federation statistics.

In Egypt the formation of a Department of Agriculture was very long delayed, and until 1911 the work was done entirely by the Khedivial Agricultural Society, which still continues its activities under the title of the Royal Agricultural Society. The Ministry of Agriculture now devotes a great part of its activities to cotton, including the distribution of approved seed, while the State Domains, a Government department owning large areas of cotton land, provide a model to cotton growers,

and produce the best cotton grown in the country. It also publishes acreage and crop reports. The Cotton Research Board was established by the Government in 1919 to combine, co-ordinate, and extend research in regard to cotton, and owns land with laboratories at Giza, near Cairo. There is an unofficial organization known as the Egyptian General Agricultural Syndicate, which represents the interests mainly of the larger landowners. The Spot and Futures Exchanges at Alexandria are run by the Alexandria General Produce Association. The Spot Market is at Miniet-el-Bassal, near the docks and cotton warehouses, but futures business is done in the Bourse in the city. The Association also publishes reports on the progress of the crop monthly throughout the season, and weekly and annual statistics of arrivals, stocks, exports, etc.

In India the development of the Departments of Agriculture since the beginning of the century has been very rapid, and a great deal of attention has been paid to the improvement of the cotton crop, especially in staple. In 1917 the Indian Government appointed a special committee to survey the whole position of the Indian crop, with special reference to the production of long staple cotton, and their report, presented in 1919, is a valuable compendium of information with regard to all the Indian cotton areas. As the result of the recommendations of that Committee a great deal has been done to improve the organization of the Indian markets. In the first place, the Indian Central Cotton Committee was founded in 1921, and contains representatives of agricultural and commercial interests, both Government and private. Its constitution was settled by the Indian Cotton Cess Act of 1923, which established a cess or tax of 2 annas per bale on all Indian cotton exported or consumed in the Indian mills. From this

an income of about £40,000 per annum is provided for the Committee. The work of the Committee is to promote agricultural and technological research in the interests of the cotton industry in India, and to co-ordinate the work of every agency throughout the country interested in cotton growing. With a view to obtaining the necessary control of the handling and marketing of cotton in India they secured the passing of the Cotton Transport Act, 1923, and the Cotton Ginning and Pressing Factories Act, 1925. The Indian crop forecasts are published by the Commercial Intelligence Department of the Government.

The principal cotton markets in India are in Bombay, and the organization and control of these markets until recently required unification. As the result of the recommendations of the Committee of 1919 the East India Cotton Association was formed in 1921, which now controls both spot and future markets. Thus the whole organization of the cotton industry in India is now supervised by two authoritative bodies, whose constitution is fully representative of every interest throughout the country, and even abroad.

In the manufacturing end of the industry, especially in England, organizations of masters and men have existed almost as long as the industry. The first of the Cotton Spinners' Unions was established in Manchester as far back as 1795; and the cotton industry also led in the formation of large amalgamated associations of workers, that of the Operative Cotton Spinners of Lancashire and adjoining counties having been constituted in 1853. Spinning, however, includes so many subordinate sections, e.g. the card room, blowing room, etc., that many of these developed separate organizations, which still maintain their independent existence, though

closely allied to the spinners. The organization of the weavers goes back as far as 1840, and a large number of local associations had been formed when in 1884 they also became federated in the Northern Counties Amalgamated Association of Weavers. The following list, therefore, represents the present organizations of the operatives—

Amalgamated Association of Card and Blowing Room Operatives.

Amalgamated Beamers', Twisters', and Drawers' Association.
Amalgamated Association of Operative Cotton Spinners and Twiners.

Amalgamated Northern Counties Association of Warpers, Reelers, and Winders.

Ball Warpers' Association.

Warp Dressers' Amalgamation.

Amalgamated Weavers' Association.

Amalgamated Power Loom Overlookers.

Society of Cloth Lookers (Amalgamated Textile Warehousemen).

Amalgamated Associations of Slashers and Tapers.

Operative Bleachers', Dyers', and Finishers' Association.

The operatives' amalgamations appoint representatives to the Legislative Council of the Textile Workers' Association, which deals exclusively with legislative questions affecting the cotton industry.

The development of organization among the employers has been on somewhat similar lines. Forty years ago all the chief towns had their own Masters' Association, but in 1891 they were amalgamated into the Federation of Master Cotton Spinners' Associations, Limited, which now has branches in fourteen districts, and a membership of firms owning over 56 million spindles. An elaborate and most efficient organization has been built up under which any industrial dispute arising in a district is first dealt with by the local association, and if a settlement is not reached is referred to the Federation; and the best testimony to the efficiency of the whole system is the

very small number of disputes that have actually led to a stoppage in the trade since 1893.

On the manufacturing side the corresponding organization of the masters is the Cotton Spinners' and Manufacturers' Association, formerly known as the N. and N.E. Lancashire Master Cotton Spinners' and Manufacturers' Association. Its work is on similar lines to the spinners' federation, and where members belong to both associations, because they have spinning as well as weaving mills, the decisions of each body are mutually applied. The calico printers and the dyers and finishers also have their separate organizations.

As the Brooklands Agreement will always be associated with the name of Sir Charles W. Macara in the English organization, so will the establishment of the International Federation of Master Cotton Spinners' and Manufacturers' Associations in the international organization of the cotton trade. The first international conference took place at Zurich in May, 1904, as the result of an agreement between the English Federation and the Swiss Federation, and nine nationalities were represented. Sir Charles Macara was the first chairman, and up till the war annual congresses were held at Manchester (1905), Bremen (1906), Vienna (1907), Paris (1908), Milan (1909), Brussels (1910), Barcelona (1911), and Scheveningen (1913). Under the auspices of the International Federation, deputations of more than 100 cotton spinners visited the American cotton belt in 1907, and Egypt in 1912, and held conferences with the cotton planters and merchants in these countries. The war, of course, completely suspended the activities of the Federation; but as soon as possible after the Armistice its work was resumed and conferences have since been held at Zurich (1920), Stockholm (1922), and Vienna (1925), and in January, 1927, a second visit was paid to

Egypt. In addition to its work in furthering the interest of cotton spinners and manufacturers in all questions affecting the cotton world, the Federation has laid the whole trade under an obligation by compiling the world statistics of mill stocks and consumption which have already been referred to. It also publishes a quarterly bulletin on cotton affairs throughout the world.

On the question of statistics, reference should also be made to the work of the International Institute of Agriculture at Rome, founded in 1905, which now forms the most reliable centre for the collection and publication of statistics with regard to cotton growing throughout the world.

Scientific research on the manufacturing side of the industry in England is in the hands of the British Cotton Industry Research Association. In August, 1916, after preliminary inquiries dating back to January of the same year, the Advisory Council of the Department of Scientific and Industrial Research appointed a provisional committee to consider the formulation of a scheme of research for the cotton industry. Later on this provisional committee became a committee of the Advisory Council, with Mr. A. Abbott, an Assistant Secretary to the Department, as Secretary, and its work began in December, 1916. The preliminary discussions were rather prolonged, and it was not until 1919 that the British Cotton Industry Research Association was formally established. Membership is open to British corporations and firms engaged in any of the branches of the cotton industry, and to corporate federations. Subscriptions for ordinary members engaged in the cotton industry are based on the amount of capital for the time being employed in the business of the member, in the proportion in which cotton is wholly or in part used as a primary raw material. In other cases there are agreed

assessments. Large groups of associated firms may, however, join as single units. Over 90 per cent of the spinners, weavers, finishers, dyers, and printers are members of the Research Association.

The Council includes representatives of all the organizations of employers and operatives in the trade. In May, 1920, the Association acquired a house and estate at Didsbury near Manchester, which once belonged to Daniel Adamson, one of the prime movers in the construction of the Manchester Ship Canal, and it was in this house that on 27th June, 1882, the first decision was taken to embark on the construction of the canal. The house, which is now known as the Shirley Institute, has been largely reconstructed, and a range of laboratories, workshops, and other necessary buildings erected. The house also contains a library and information bureau.

Whilst realizing that individual effort in research should be made use of as far as possible, the Council of the Research Association decided at the outset that the most rapid progress was likely to be made on the lines recommended by the Provisional Committee, namely, by means of co-operative research. Past experience has revealed the disadvantages of investigating, from the point of view of any one branch of science, such many-sided problems as are presented for solution by the cotton industry. It was felt that the desired results would only be forthcoming when the chemist, the colloidal chemist, the physicist, the botanist, the technologist, and perhaps also the engineer, were brought together under one roof, not as individuals each searching for a solution of some definite problem in his own science, but as a body of workers co-operating under the guidance of one director.

The work of the Institute has dealt mainly with the problems of manufacturing cotton, but always keeping

in view the necessity of correlating these problems with the properties of the raw material. It was recognized that there was need for better methods by which various growths of cotton could be defined as to their spinning and finishing qualities, especially if the use of the newer cottons grown within the Empire is to be promoted. Methods have been devised, therefore, at the Shirley Institute for investigating at the same time the measurable characters, such as length, fineness, and lustre of raw cottons, and also their spinning properties, and the resulting proposals have definitely assisted spinners in blending unfamiliar cottons with their usual material, and have often enabled an identification to be made of the cotton used in the manufacture of a particular fabric. Chemical methods for distinguishing between the main types of cotton have also been discovered.

A study of many faults in fabrics has shown that there is a demand for greater regularity in the yarn employed. Methods of yarn testing have, therefore, been devised in the physics department of the Institute which place more emphasis on the quality of regularity than tests hitherto employed ; and an examination of the spinning process, stage by stage, is in progress to test where these irregularities are lessened and where accentuated. So far, it has been proved that common practice in the early stages is comparatively harmless to the strength and staple of the raw material, and that a great variety of alternatives is permissible on the spinning frame without affecting the regularity in twist or strength of the yarn. Among the alternatives are those of various " High Draft " systems. These are calculated to reduce the cost of production very considerably, but Lancashire spinners have feared that they would produce less regular yarn. The proof afforded by thousands of tests at the Institute that this fear is unfounded has created great interest in

Lancashire, and machine makers and many spinners are now busy with English inventions in this field.

Yarn regularity is most important in doubling for the production of mercerized yarns. Methods have been devised for measuring the lustre of yarns, and it has been proved that the optimum "doubling twist," for which the lustre is a maximum, is seven-tenths of the singles twist. Irregularities in the twist in the single yarns are not eradicated by doubling, nor are the fluctuations in the doubled yarn improved by mercerization, so it is not surprising to find that the lustre of a mercerized yarn may vary by as much as 66 per cent from place to place.

Any work which will place the operation of sizing on a scientific basis is obviously of great value to the trade. It has already been shown that the fundamental property of size is to cement the individual cotton hairs together in the yarn so that they do not slip under strain, and that most sizes are equally efficient in this respect. Other factors which matter in sizing include the readiness with which the yarn is wetted and penetrated by the size, and the intrinsic strength of the dry film of size which is left on the yarn, and the way this is modified by moist atmospheres. Work has already been done on these problems, including a study of the viscosity of size mixings which has led to results of considerable interest in other branches of technology.

A study has also been made of the changes which occur in cellulose if over-bleached, and three tests have been proposed by means of which the bleacher can exercise very exact laboratory control over his operations. One of these is a simple modification of a test used in the explosives industries, namely a determination of the viscosity of a solution of the cotton material in cuprammonium hydroxide.

Another process which often leads to losses is mercerization. It is known that the enhanced lustre brought about by this process depends on the swelling of the individual cotton hairs, so that they reflect light more advantageously. The swelling is accompanied by shrinkage in length, which in practice is balanced by stretching the material while wet and in the plastic condition imposed on it by immersion in the mercerizing agent, namely, caustic soda. The swelling has another effect, however; it increases the affinity of the cotton for dyes, so that if mercerization is not uniform throughout the material, patchy effects in dyeing will result. Already it is known which caustic soda solution is most effective for swelling, and methods have been developed for testing the lustre produced, the degree of mercerization, and the effect of tension and its mode of application. Interesting results have also been obtained by studying the effect of caustic soda on the single cotton hair. This consists of a cuticle of non-cellulose material encasing a tube of cellulose with a central canal or "lumen," the whole being most irregular in cross-sectional shape, something like a bean. In the mercerizing liquid the cellulose swells inward, and almost blots out the lumen, and swells outward until the cuticle has rounded off to a stout ellipse of exactly the dimensions possessed by the cotton hair as it existed in the boll just before it burst open. But for the cuticle, the cellulose could swell further, and actually some considerable pressure is exerted inside the swollen hair.

Whilst the Institute staff does not usurp the functions of the expert referee in cases of dispute, it does examine faults which are of common occurrence throughout the industry, and especially those which require new research methods, or the application of methods which are beyond the scope of the ordinary testing laboratory. Faults of

this kind are much more common than is generally supposed. Troubles due to oil and rust stains have been reduced very considerably by the invention of special cleaning agents, which are now used extensively by the trade, and the "cuprammonium" viscosity test, mentioned above, has often settled the question whether damage in a fabric was caused by chemicals or was due to mechanical weakness.

Of all the sources of trouble in cotton manufacturing and marketing, mildew seems to be the worst. Many mould fungi and bacteria will grow quite well on damp raw cotton, though bleached cotton is more immune. Some of the ingredients used in sizing and in certain glazing processes provide richer food still, so that most fabrics are susceptible to mildew if exposed to damp. Some of the organisms causing the trouble come into the country with the raw cotton, but the majority are prevalent in the atmosphere everywhere. The damage is of several kinds, grey, black, or coloured spots on white goods, musty smell, bleaching out of dyes and weakening of the material, and the trade suffers severe losses through it, especially in tropical markets. A check on the trouble is attempted by mixing antiseptics with the size, but as this is only applied to warp threads, the weft remains exposed. The problem is now being systematically studied, and it is already known that the present measures of the trade are wholly inadequate to prevent the growths of mildew in favourable circumstances. It is not easy, however, to find an antiseptic which is cheap and effective and at the same time odourless and without action on dyes or the fibres, but considerable progress has been made towards the discovery of suitable antiseptics both for sized goods and for conditioned yarn.

A special testing department at the Institute is gaining knowledge of the effects of atmospheric conditions

on the tensile properties of cotton goods, and is devising new methods of testing which approximate more closely to the actual circumstances of wear and tear than do most of the existing tests. A ballistic machine which breaks the specimen by means of the energy of a falling pendulum is now on the market.

The scientific publications of the Research Association appear in the monthly journal of the Textile Institute. This organization, which looks after the technological interests of the cotton trade as well as of other textile industries, was founded in 1910, and was incorporated by Royal Charter in 1925. It has its headquarters in Manchester, with sections in London and all the more important textile centres.

Lecturers. E. J. Griffith, Colonel J. J. Shute, C.M.G., D.S.O., R. Brooks, Frederick Holroyd, J. C. Withers, Ph.D., John A. Todd.

References.

Report of the Board of Trade Committee on the position of the Textile Trades after the War, 1918. Cd. 9070.

Report of the Empire Cotton Growing Committee, 1919, Cd. 523.

Report of the Indian Cotton Committee, 1919 (long staple cotton).

Annual Reports of the Indian Central Cotton Committee.

Bombay Cotton Annual (published by the East Indian Cotton Association).

International Cotton Federation—Reports of the Annual Conferences, etc., 1905-27.

Handbook of Spinning Tests for Cotton Growers. (Macmillan.)

A Method of Measuring the Length of Cotton Pairs (Balls). (Macmillan.)

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