

Indian Central Cotton Committee
Technological Laboratory.

Technological reports on standard
Indian cottons.

For the year 1931, 1932

Technological
Series A, No. 1



Indian Central Cotton Committee
Technological Laboratory

TECHNOLOGICAL REPORTS
ON
STANDARD INDIAN COTTONS
1931

BY

NAZIR AHMAD, M.Sc., Ph.D.,

Director, Technological Laboratory, Matunga, Bombay.



BOMBAY :
THE TIMES OF INDIA PRESS

1931

Presented
by
JEHANGIR BOMANJEE PETIT.

July 1931.

Technological Bulletin,
Series A, No. 18.

Indian Central Cotton Committee
Technological Laboratory

TECHNOLOGICAL REPORTS
ON
STANDARD INDIAN COTTONS
1931

BY

NAZIR AHMAD, M.Sc., Ph.D.,
Director, Technological Laboratory, Matunga, Bombay.



SERVANTS OF INDIA SOCIETY'S
BRANCH LIBRARY
BOMBAY

BOMBAY:
THE TIMES OF INDIA PRESS
1931

Price Rs. 2.

PREFACE.

THE term "Standard Indian Cottons" is applied to certain improved varieties of cotton which, in several parts of India, are steadily replacing the older varieties, and which, at present, cover some 15 per cent. of the total area under cotton cultivation. It is the practice at the Technological Laboratory to subject the standard cottons of each season to a very thorough test. The Technological Reports included in the present bulletin contain the results of these tests on standard cottons of eight seasons, *viz.*, 1923-31, together with the Agricultural Details, the Grader's valuation report, and the Spinning Master's report on each cotton, the details of machinery, treatment, waste percentages, yarn-breakages and the physical conditions prevailing in the Laboratory. The general plan followed in each report is the same as in the past years, with this difference that the values for the work of rupture of alea, as found by the ballistic method, are included for the first time.

Last year a Bombay cotton—Wagad 4—was omitted from the list of the standard cottons. This year a Punjab cotton—Punjab-American 285F—has been left out. This cotton has not only given a poor average yield over several seasons, but has been found highly susceptible to climatic conditions, and has practically gone out of cultivation.

My thanks are due to my predecessor Dr. A. James Turner, from whose bulletin "Technological Reports on Standard Indian Cottons, 1930" I have not only lifted bodily the reports on the three American cottons, but have also derived much help in the writing of the Introduction.

I have also to acknowledge my great indebtedness to W. Ellis Jones, Esq., and other members of the East India Cotton Association for the Grader's Reports, the Agricultural Officers for the supply of the standard cottons and the agricultural details concerning them, and the Spinning Master (Mr. R. P. Richardson) and the staff of the Technological Laboratory for their co-operation in carrying out the tests and the compilation of the results.

N. A.

July 1931.

CONTENTS.

	PAGE
I. Introduction	1
Indian Cotton Crop	1
Work of the Agricultural Departments.. .. .	1
Standard Cottons	3
Scope of the Reports	4
(i) Agricultural Details	4
(ii) Grader's Report.. .. .	4
(iii) Fibre Particulars	4
(iv) Spinning Tests	4
(v) Remarks	4
Size of the sample	4
Objects of the Tests	5
II. Details of Spinning Tests	6
Details of Machinery	6
Spinning Technique	7
Waste	8
Spinning Speeds	9
III. Details of Fibre Tests	10
Mean Fibre-Length	10
Fibre-Weight per inch	10
Fibre-Strength	12
Fibre-Rigidity	13
Ribbon-Width	13
Convolutions or Natural Twist	13
Size of a satisfactory sample for fibre-tests	13
IV. Details of yarn tests	14
Lea Tests	14
Ballistic Tests	14
Single Thread Tests	14
Counts Actual	15
Twist	15
Evenness	15
Neppiness	15
Irregularity	15
Yarn Breakages in the Ring Frame	16
V. Standards of Twist and Strength	16
Twist Standards	16
Strength Standards	16
VI. The Spinning Value of a cotton	17
VII. Physical Conditions	18
VIII. Presentation of Results	19
IX. Seasonal Variation of Standard Cottons	19
X. Standard Cottons of 1930-31	21

	PAGE
XI. Technological Reports on Standard Indian Cottons	22
1. Dharwar 1—(Kumpta)	22
2. Jayawant—(Kumpta)	26
3. Gadag 1—(Dharwar-American)	30
4. Surat 1027 A. L. F.	34
5. Wagad 8—(Dholleras).. ..	38
6. Punjab-American 4F.	42
7. Punjab-American 289 F.	46
8. Mollisoni (Bengals)	50
9. Aligarh A. 19—(Bengals)	54
10. Cawnpore K. 22	58
11. Bundelkhand J. N. 1—(Bengals)	62
12. Cawnpore-American C. A. 9	66
13. (a) Nagpur-Verum 262	70
(b) Akola-Verum 262.. ..	74
14. Umri Bani	78
15. Cambodia Co. 1—(Cambodia 295)	82
16. Cambodia Co. 2—(Cambodia 440)	86
17. Nandyal 14—(Northernns)	90
18. Hagari 1—(Westerns)	94
19. Hagari 25—(Westerns)	98
20. Karunganni C7	102
21. American Cottons	106
22. Summary of Fibre-Properties of Standard Indian Cottons—	
A.—English Units	110
B.—Metric Units	112
23. Summary of Spinning Test Results on Standard Indian Cottons—	
(a) Bombay and Punjab Cottons	114
(b) United Provinces, Central Provinces, and Hyderabad Cottons.. ..	115
(c) Madras and American Cottons	116

Indian Central Cotton Committee Technological Laboratory.

Technological Reports on Standard Indian Cottons, 1931.

BY

Nazir Ahmad, M.Sc., Ph.D.,

Director, Technological Laboratory, Matunga, Bombay.

1. INTRODUCTION.

Indian Cotton Crop.—The commercial cotton crop of India is composed of a great many varieties, some of which are indigenous while others are exotic. These varieties may differ considerably among themselves as regards yield, ginning percentage, feel, colour, cleanliness, fibre-properties, spinning performance and yarn-characteristics. This is hardly surprising when we remember that in a vast country, such as India, the climatic conditions, the amount of rainfall, the composition of the soil, etc., may be very different in places separated by large distances. It thus happens that, on the one hand, we have the coarse and short-stapled *desi* cotton, which is suitable for 8/10's reeling and, on the other, the fine and long-stapled Cambodia which will give satisfactory 36's warp. The table on page 2 gives the distribution of the Indian cotton crop according to the trade descriptions, the blow-room loss sustained by each growth and the types of yarns for which each cotton is suitable.

Work of the Agricultural Departments.—The Agricultural Departments of the various provinces have, for many years, pursued the policy of evolving new and improved varieties, which should be suitable to the specific conditions prevailing in different parts of the country. It is sufficient, for any of these new varieties, to possess one or more of the following advantages over the cotton which it is intended to replace in general cultivation. It should be less susceptible to attack from the particular disease or pest from which cotton in that area has suffered in the past, so that the farmers would grow it with greater confidence. Or it should, as compared with the old variety, give a better yield and have a higher ginning percentage, giving thereby a better monetary return to the cultivator. Or, finally, it should be distinguished by a longer and finer staple, which should enable it to fetch a better premium in the market, as compared with the old variety. These are in brief, the three principal directions along which improvement is aimed at by the Agricultural Officers engaged on cotton breeding.

These officers had isolated, for their research purposes, certain improved varieties which were grown each season *from pure seed under as nearly same conditions as possible*. These were employed as standards of reference and the new selections, made from time to time, were compared with them as regards hardihood, yield, or quality of staple. These cottons also provided the means for undertaking as well as checking the results of various physiological, botanical or agronomical experiments undertaken by the departments. Gradually the farmers became acquainted with many of these agricultural standards and their cultivation was extended from the experimental farms to the cultivator's fields.

TRADE DESCRIPTIONS.

Hedge Contract.	Description of Cotton.	Acres. * (Thousands)		Bales of 400 lbs. each. * (Thousands)		Yield per acre (lbs.)		Blow room * Loss %	Counts.
		1930-31.	1929-30.	1930-31.	1929-30.	1930-31.	1929-30.		
BENGALS	United Provinces	843	929	321	289	152	124	9-11	8/10's reeling or weft yarn.
	Rajputana	541	541	84	78	62	58		
	Sind-Punjab.. ..	1,888	2,058	567	595	120	116		
	Others	75	76	16	15	85	79		
Total Bengals		3,347	3,604	988	977	118	108
BROACH	Broach-Ankleshwar	1,092	1,324	227	284	83	86	9-10	18/20's weft. 20/22's warp. 20's warp. 30's warp, 40's weft. 20/24's warp. 20/22's warp.
	Surat.. ..								
	Saw-ginned Dharwar								
	Navsari	836	806	270	248	129	123		
	Punjab-American	65	27	20	8	123	119		
	Sind-American	2,445	2,807	491	509	80	73		
Dholleras							14-16		
Total		4,438	4,964	1,008	1,049	91	85
OOMRAS	Khandesh	1,210	1,373	289	249	96	73	11-12	10/12's reeling. 16/20's weft. 16/20's weft. 26/28's warp, 30/36's weft. 12/14's reeling. 12/16's reeling (1). 10/12's reeling (2).
	Central India	1,903	2,021	308	291	65	58		
	Barisi and Nagar	2,303	2,829	262	341	46	52		
	Hyderabad-Gaorani	971	916	114	126	47	55		
	Berar	3,212	3,443	704	748	88	87		
	Central Provinces No. 1	1,575	1,732	358	395	91	91		
Central Provinces No. 2									
Total		11,174	12,114	2,035	2,150	73	71
SOUTHERNS	Compta-Dharwars	1,398	1,746	192	284	55	65	13-15	22/28's warp. 20's warp. 20's warp. 20's warp. 28/30's warp, 36/40's weft.
	Westerns and Northern	1,558	1,551	163	172	42	44		
	Cocanadas	196	259	32	45	65	69		
	Tinnevellies	517	601	133	162	103	108		
	Salems	188	221	33	38	70	69		
	Cambodias	298	395	113	144	152	146		
Comillas, Burmas and others		502	467	123	104	98	89	9	8/10's reeling.
GRAND TOTAL.. ..		23,616	25,922	4,820	5,125	82	79

* Indian Trade Journal, April 30th, 1931.

Standard Cottons.—When the task of giving authoritative valuation to the cotton breeders on new types of cotton devolved upon the Technological Laboratory of the Indian Central Cotton Committee, it was realised that it would be necessary to have certain standards of reference. These standards should include a few types from each Province; they should, so far as possible, be grown from pure seed and under the same conditions, and they should be available in the successive seasons. As these conditions are fulfilled by the agricultural standards referred to above, and as the area under their cultivation, which already amounts to nearly 3½ million acres, is being extended, these cottons were adopted as standard cottons for the purposes of the tests undertaken at the Laboratory. The following list gives the distribution of these cottons according to the Provinces, the area under their cultivation in 1930-31 and the season in which they were first tested at the Technological Laboratory. It may be mentioned that occasionally, when a cotton has definitely proved unfit for general cultivation or has been superceded by a better variety, it is omitted from the list, just as a new cotton which, having given satisfactory results for several seasons, has found favour with the cultivator, is included in it.

LIST.

<i>Cotton.</i>	<i>Area under cultivation (Acres).</i>	<i>Season in which the cotton was first tested at the Technological Laboratory.</i>
<i>Bombay Cottons.—</i>		
1. Dharwar 1 (Kumpta)	50,000	1923-24
2. Jayawant (Kumpta)	18,000	1926-27
3. Gadag 1 (Dharwar-American)	78,600	1923-24
4. Surat 1027 A.L.F.	450,000	1923-24
5. Wagad 8 (Dholleras)	1,500	1925-26
<i>Punjab Cottons.—</i>		
6. Punjab-American 4F	793,000	1924-25
7. Punjab-American 289F	14,000	1924-25
8. Mollisoni (Bengals)	185,800	1925-26
<i>United Provinces Cottons.—</i>		
9. Aligarh A. 19 (Bengals)	80,000	1924-25
10. Cawnpore K. 22	<i>Nil</i>	1924-25
11. Bundelkhand J. N. 1	<i>Nil</i>	1924-25
12. Cawnpore-American C. A. 9	<i>Nil</i>	1924-25
<i>Central Provinces and Berar Cotton.—</i>		
13(a). Verum 262 (Nagpur)	150,000	1926-27
13(b). „ (Akola)	35,000	1927-28
<i>Hyderabad Cotton.—</i>		
14. Umri Bani	971,146	
	(under cultivator's seed.)	
	200,000	1924-25
	(under Government seed.)	
<i>Madras Cottons.—</i>		
15. Cambodia Co. 1 (Cambodia 295)	26,000	1923-24
16. Cambodia Co. 2 (Cambodia 440)	1,500	1924-25
17. Nandyal 14 (Northern)	27,300	1923-24
18. Hagari 1 (Western)	160,300	1924-25
19. Hagari 25 (Western)	121,374	1923-24
20. Karunganni C7	10,620	1924-25

Scope of the Reports.—These standard cottons, on being received at the Technological Laboratory, are subjected to a very thorough examination of their fibre properties, spinning performance and yarn-characteristics. The results will be found in full detail, in the Technological Reports which comprise the major part of this Bulletin. The report on each cotton is divided into the following five sections.

(i) *Agricultural Details.*—These are, as a rule, supplied by the Agricultural Officers and give information regarding the history, the district of growth, and the growing period of the standard cotton; the soil and climatic condition in which it is grown, various plant particulars such as weight of seed, weight of lint per seed, ginning percentage, etc., the yield per acre of the seed cotton, and, finally, the area under cultivation of the standard cotton in the different seasons. It must be remembered that these values are either averages over several seasons or those obtained under specified conditions and are therefore likely to differ considerably from the corresponding values obtained under different conditions or in any one season.

(ii) *Grader's Report.*—This gives the Grader's estimate of the various factors concerning the cotton, which are of commercial importance such as class, colour, staple length, staple strength, and regularity, and also his estimate of the market value of the cotton.

(iii) *Fibre Particulars.*—This section contains the values obtained, for the standard cotton, of the following fibre properties:—fibre-length (by two methods), fibre-weight per inch, fibre-strength (by two methods), fibre-rigidity, ribbon-width, and number of convolutions per inch of the fibre. It also includes a sorter diagram for the cotton which, at a glance, gives an idea of the relative proportion of fibres of different length-grades in the cotton as well as variation (if any) in its fibre-length as compared with the average of the past seasons.

(iv) *Spinning Tests.*—This section contains an account of the treatment given to the cotton, the Spinning Master's report on its performance in the various processes of spinning together with a table showing the loss sustained by it in the blow-room and the card-room, the number of yarn-breakages in the ring frame, and the results of tests on the yarns spun from it for strength (lea, single thread and ballistic), number of turns per inch, regularity, evenness and neppiness. The physical conditions of humidity and temperature prevailing in the spinning room and the testing room are also shown in the table.

(v) *Remarks.*—The results of the previous sections are discussed and summarised in this section, especially with reference to the waste percentages, the quality of the yarn and the seasonal variation in the fibre properties and the spinning value of the cotton.

Size of the sample.—It has already been mentioned that it is necessary to ensure the regular supply of the standard cottons in the successive seasons. The question now arises: "What is the minimum size of the sample required for a satisfactory test?" In arriving at a decision on this point, two considerations are of primary importance. On the one hand, the sample should be sufficiently large for the Laboratory test to reflect fairly accurately the spinning value of the cotton as given by a test made under ordinary mill conditions. For, it must be remembered, that if the cotton were to be recommended for general cultivation, the opinion of the practical spinner on its performance will have considerable weight in determining its market value. On the other hand, the quantity required for the Laboratory test should *not* be so large as to hamper the cotton breeder in his work of isolating new strains. The importance of this consideration will be realised when we remember that it takes the cotton breeder three years to grow a few pounds of lint of a new strain. If a large quantity of lint, say 100 lbs., is

demanding of him for a test on a new strain, not only will he have to wait for a longer time before he is able to decide which of his strains are worth propagating, but he will also have to reduce their number, as each strain will now claim for itself a bigger slice of the limited area of his farm.

In view of these considerations elaborate tests were made in the beginning on samples of different sizes, ranging from 100 lbs. to 1 lb.; and, as a result, it was found that, with the special routine adopted at the Laboratory, a 10 lb. sample was ordinarily quite sufficient for a satisfactory spinning test. Accordingly, this is the weight of the sample used in an ordinary test, but for the standard cottons, tests are made on two lots, weighing 10 lbs. each.

In judging the suitability of the size of the sample it should be borne in mind that the normal routine of the Laboratory is specially adapted for handling and testing small samples. The staff is trained for the work and the plant is small; it is, consequently, possible to give close and individual attention to each sample in the various stages of the spinning process. Although the samples are spun in rather more favourable conditions than they would be in a mill, these conditions are perfectly definite, and the results of the tests can be taken to provide a reliable guide to the performance of a cotton, when spun in bulk. The only serious objection that can be levelled against using a small sample is that the scutcher lap may not be uniform, and may, therefore, give rise to a yarn which may not be representative of a large sample. This difficulty has been overcome by using a special routine in the preparation of the scutcher lap which will be described later.

Objects of the tests.—These tests on standard Indian cottons are undertaken with a fourfold object. In the first place it is proposed by repeating tests on the same cottons, grown under as nearly the same conditions as possible, to establish a scale of reference for the Indian cottons in general. We know, for instance, that in a given season a Punjab-American cotton, grown for commercial use, has given a certain performance. We also know, from this Report, the performance of the same cotton, grown from pure seed. By comparing the two, we are in a position to judge how much the commercial type deviates from the pure type and attempt to trace the cause. If the two cottons are not grown at the same station, allowance must, of course, be made for differences in the soil and the climatic conditions.

Secondly, as these tests are repeated season after season, they afford excellent means for the study of the seasonal variation in the fibre properties and the spinning value of these cottons. This study of seasonal variation is valuable in two ways. In the first place, provided it is spread over a sufficiently long period, it gives us information as regards the *average* quality of the standard cotton as well as the range within which it is likely to fluctuate. In the second place, since the standard cottons are *not* selected at random but with an eye to the distribution of the commercial crop, their seasonal variation reflects, to some extent at least, the variation in the average quality of the crop produced by the change in the climatic conditions.

The third purpose served by these tests is to provide the necessary data for the correlation of fibre properties of cottons with their spinning value. The importance of establishing a satisfactory relationship of this kind lies in the fact that the cotton breeder is anxious to know, at the earliest possible stage, which of his new strains are likely to prove acceptable to the spinner. The spinning test which, at present, is the only satisfactory means of finding the spinning value of a cotton suffers from two drawbacks. In the first place, it requires a large outlay on machinery and apparatus and the services of a trained staff, and is not, therefore, within easy reach of every Cotton Breeder. Secondly, it imposes upon him restrictions as regards the minimum weight of lint required for the test. Both these factors tend to

cut down the number of new strains which can be examined in a single season. It follows, therefore, that if a satisfactory formula could be established, by means of which it would be possible to predict the spinning value of a cotton from its fibre properties, it would save a great deal of time and labour. It would enable the cotton breeder to decide for himself, by making tests on little more than a handful of lint, which of his selections will appeal to the spinner. The problem is complicated by the well-known susceptibility of cotton to climatic and soil conditions, and can only be tackled satisfactorily by the statistical method. For this purpose a few observations here and there are not enough; it is necessary to have the results of a systematic investigation extending over several seasons. Now, as has already been mentioned, besides the spinning test, half a dozen fibre properties are accurately determined for each standard cotton. The accumulated results of several seasons should therefore provide just the kind of data required for correlating the fibre properties with the spinning value of a cotton.

The fourth object of these tests is to provide the trade with detailed information concerning the standard cottons. Many of these cottons are improved varieties, having been evolved after years of scientific research, and it is hoped that a bulletin containing all the particulars required by a practical man will help to give them their proper place in the world's markets.

II. DETAILS OF SPINNING TESTS.

Details of Machinery.—The following machines are normally used for the spinning tests:—

BLOW ROOM MACHINERY.

- (1) (Porcupine) Lattice Feeder; porcupine speed 750 r.p.m.
- (2) Crighton Opener; beater speed 750 r.p.m.
- (3) Hopper Feeder.
- (4) Scutcher—

Three-bladed beater speed: 1,000 r.p.m.
Beater setting to feed roller: $\frac{11}{32}$ inch.
Weight of lap: $12\frac{3}{4}$ oz. per yard.

CARD ROOM AND SPINNING MACHINERY.

- (5) Revolving Flat Card—
Cylinder speed: formerly (up to Sample No. 56) 190 r.p.m., now 160 r.p.m.
Doffer speed: 14 r.p.m.
Flat speed: formerly (up to Sample No. 56) 4 inches per minute, now 3 inches per minute.
Hank: 0.13 for 10's; 0.17 for 20's only; 0.18 for 20-40's.
- (6) Drawing Frames—
Front roller speed: 360 r.p.m.
Front roller diameter: $1\frac{3}{8}$ inch.
Hank: 0.16 for 10's; 0.19 for 20's only; 0.20 for 20-40's.
- (7) Slubbing Frame (36 spindles)—
Front roller speed; 210 r.p.m.
Front roller diameter: $1\frac{1}{8}$ inch.
Hank: 0.55 for 10's; 0.71 for 20's only; 0.77 for 20-30's; 0.85 for 20-40's.
Spindle speed: 650 r.p.m.
- (8) Intermediate Frame (50 spindles)—
Front roller speed: 156 r.p.m.
Front roller diameter: $1\frac{1}{8}$ inch.
Hank: 1.00 for 10's; 1.65 for 20's only; 1.70 for 20-30's; 1.85 for 20-40's.
Spindle speed: 780 r.p.m.

(9) Roving Frame (64 spindles)—

Front roller speed : 132 r.p.m.
 Front roller diameter : 1 inch.
 Hank : 2.00 for 10's ; 3.70 for 20's only ; 4.30 for 20-30's ;
 4.75 for 20-40's.
 Spindle speed : 1,160 r.p.m.

(10) Twist Ring Frame (48 spindles)—

Front roller diameter : $\frac{7}{8}$ inch, but 1 inch for long staple Americans.
 Lift : $5\frac{1}{2}$ inches.
 Diameter of rings for all counts up to 40's : $1\frac{5}{8}$ inch.
 Traveller counts : 5 for 10's ; 1 for 14's ; 3/0 for 20's ; 5/0 for 24's ;
 6/0 for 26's ; 7/0 for 30's ; 9/0 for 34's ; 12/0 for 40's.
 Spindle speed : 6,100—7,100 r.p.m. for counts up to 10's ;

6,800—8,100 r.p.m. for 10—20's ;
 8,900 r.p.m. for 20's ;
 9,550 r.p.m. for 30's ;
 9,950 r.p.m. for 40's.

For the 1923-26 cottons the spindle speeds were : 7,600 r.p.m.
 for counts up to 10's, and 8,600 r.p.m. for other counts.

The hank numbers, the traveller counts and the spindle speeds for the 1930-31 standard cottons are given, in each case, in the tables containing the spinning test results, which also contain other ring frame particulars.

Spinning Technique.—In the earlier edition of this Report the detailed treatment of samples in the blow-room and the card-room of the laboratory has been fully described. The following account is taken from the "Technological Reports on Standard Indian Cottons*, 1930" pp. 14-17.

"Normally the cotton is passed through the lattice feeder, which feeds direct to the Crighton opener ; the material is collected after passing through the Crighton and is then passed through this machine a second time, being fed by hand. On again emerging from the Crighton the material is collected, and afterwards fed by hand to the hopper feeder, from which it falls on to the feed lattice of the scutcher. At this point one of the main difficulties in the treatment of small samples is encountered. With a small sample it is not possible to keep the hopper full throughout the whole or even the major portion of the operation, so that when the emerging cotton falls on to the scutcher lattice it gradually thins out as the amount of cotton in the hopper diminishes. In order to avoid irregularities from this cause the cotton on the scutcher lattice is evened out by hand. It then passes through the scutcher and the lap is formed. This lap is of course irregular at its two ends. Samples weighing 5 lbs. or less are only made into two laps, each of which is unrolled and doubled on itself for the next scutching, giving the equivalent of four laps ; samples weighing 10 lbs. or more are made into four separate laps direct. The four laps are then unrolled one above the other on the scutcher lattice and again passed through the scutcher. This process is repeated once again, the three passages through the scutcher corresponding with treatment by opener, intermediate, and finisher scutchers. As a result of the method of treatment adopted, only the two ends of the finisher lap are irregular. In the subsequent treatment the material of these end portions is carefully kept aside, and tests are made only on the central portion, which alone represents the normal material as it would be obtained if the cotton were being treated in bulk. Special attention is given to this point in all the subsequent stages so that the test bobbins finally obtained shall be truly representative of what would be obtained with bulk spinning. The first and last portions of the sliver delivered by the card are

* By A. James Turner, Indian Central Cotton Committee Technological Laboratory, Bulletin No. 14, Series A.

rather below normal weight and are therefore not used in the preparation of the rovings for the test bobbins; but in order to make the determinations of waste as accurate as possible, the rejected portions of sliver are passed through the subsequent machinery separately, and their weights included at each stage. It is the necessity for rejecting such portions of the material which in effect fixes the lower limit of the weight of the sample. It may be added that a 2-lb. sample is the minimum that can be spun satisfactorily in three different counts, at any rate with the present procedure. Even in this case it has occasionally been found impossible to avoid using in the preparation for the test bobbins some of the earlier portion of the card sliver which is rather below normal weight. Moreover, with a 2-lb. sample it is only possible to spin four instead of ten test bobbins in each count. All things considered, therefore, the tests on these samples can hardly be regarded as so satisfactory in general as the tests on samples weighing 5 lb. and upwards. Nevertheless, as shown in previous editions of this bulletin, it has not been found possible to justify this conclusion by reference to the actual results for 2-lb. samples.

The normal procedure after carding the material is to pass it through two heads of drawing. The material is then passed through the slubbing, intermediate, and roving frames, and spun from single roving in the ring frame. For the better class cottons the drafts from the card onwards are so arranged that the draft in the ring frame for the yarn of 30's counts is about 6, and different counts are obtained merely by changing the draft in the ring frame. This expedient has the practical advantage of saving much time in making changes in the preparatory machinery, with all the testing of wrappings that would otherwise be necessary. As it appeared possible that in these circumstances the medium counts alone could be regarded as having been spun under the most favourable conditions, the question has been investigated for a number of standard cottons and the fact established that the adoption of this procedure makes very little difference to the results of the spinning tests. Details of these "balanced and unbalanced draft tests" are given in a separate bulletin*. The actual drafts which have been used in the present tests, together with other ring frame particulars, are given in the tables relating to each sample reported on. From these particulars various deductions about the spinning operations can readily be drawn if desired. Thus, from the front roller speed (column 10) and the roller diameter (page 6), it is a simple matter to calculate the theoretical production. In most cases the figures for actual production of the highest count spun are also given, so that the spinning efficiency for this count (for which the spinning efficiency is likely to be least) can readily be calculated. The figures for card production give some idea of the conditions of working of this machine. In any table the "ring frame turns per inch" (column 12) taken with the corresponding counts (column 4), show the types of yarn spun from the particular cotton.

Waste.—Figures are given for each lot of cotton tested, to show the percentage waste made at each stage. The wastiness of a cotton is of course a very important matter because the waste represents an economic loss, even although part of it may be used in mixings for lower counts. There is no doubt that the wastiness of a cotton depends on many factors; some are derived from the characters of the cotton plant—these in turn being derived from hereditary or environmental factors operating during growth—some may be derived from the machinery used in treating the material, and others from the human element. In these reports it is impossible to separate the effects of these various factors; but from the known origin of each of the cottons it may be taken as a general rule that for any given sample the waste made is not greater, and is in many cases probably less, than would be obtained from the commercial crop of the particular cotton.

In the spinning tests great care is taken at all stages to recover the waste immediately after each lot of cotton has passed through the machinery. The waste made at each machine is weighed separately on a delicate Avery

* "The Effect of using Unbalanced Drafts instead of Balanced Drafts in the Spinning Preparation for Spinning Tests" by A. James Turner, Indian Central Cotton Committee Technological Laboratory, Bulletin No. 16, Technological Series No. 10, June 1928.

Mint balance of maximum load 50 lbs. and turning by five grains. When small samples are being tested the cleaning operations for many of the machines take up considerably more time than the actual processing of the cotton. The carding engine may be cited as an extreme example; it takes about ten minutes to effect the carding of a 2-lb. sample, but it is not until after another half an hour's running that flat strips cease to be produced, and a further twenty minutes are then necessary for cleaning. In the present reports the wastes are shown simply as totals for blow room, card room, and spinning room respectively, with the total loss given separately. It should be noted, first, that ordinary mill practice is followed in the recording of these losses; for instance, the percentage "card room loss" (column 6) represents the total loss in the card and other preparation machinery reckoned as a percentage of the weight of the laps received from the blow room; and secondly, that in the mill the spinning loss will be higher as the piecer will have far more spindles to attend to and so will take longer on the average to get to a broken end; and waste is being produced all the time such an end remains unrepaired. The total cotton losses sustained in the complete spinning tests are also reported (column 8), being given as percentages, based, of course, on the original weights of the samples.

Spinning Speeds.—As pointed out in previous editions of this bulletin, when any of the 1923-26 samples was spun into a single count with more than one degree of twist, the stronger yarn (that with the higher twist) was actually spun at a lower speed, as shown by the front roller speed, than the yarn spun with lower twist. This would be avoided in general practice and the stronger yarn spun at the higher speed. The higher speed, however, can only be obtained by speeding up the whole machine. Such a speeding up was not possible without a special motor pulley for the purpose, because the maximum speed obtainable with the variable speed motor which drives the ring frame had already been used in the spinning of the yarn with the lower twist. For the spinning of the 1926-27 and subsequent samples a larger motor pulley was therefore obtained. In order to derive the utmost advantage from this new pulley, it appeared desirable to run the ring frame at higher speeds in all tests, as by this means not only would the time occupied in carrying out the spinning tests be materially reduced but also the spinning speeds would be more in conformity with the most modern practice. The difficulty arose, however, that a change in the spinning speed might render invalid a comparison of the results obtained before and after the date of the change, unless it could be shown that the change in speed makes no difference to the results of the test. For this reason, eight of the more important standard cottons of the 1926-27 season were tested both at the old speeds and at the new higher speeds. The results of these tests at different speeds form the subject of a separate bulletin*, wherein it is shown that the differences in the results obtained under the different speed conditions are indeed quite small, and well within the range of the ordinary experimental error as revealed by the duplicate tests.

Another point of some importance may here be referred to. For the earlier samples the card waste was found to be excessive, and, in order to rectify this, the speed of the main cylinder was reduced from 190 to 160 r.p.m. and the speed of the flats from 4 to 3 inches per minute. These changes were made after the completion of the spinning tests on Sample No. 56 (Texas American); all samples bearing a higher number than this have therefore been carded at the slower speeds.

Finally, it may be observed that the same size of rings ($1\frac{1}{2}$ in. diameter) is used for the spinning of all counts of yarn, whereas the rings used in actual practice have diameters ranging from 2 in. for 6's counts to $1\frac{1}{2}$ in. for 40's counts. Hence the results obtained at the Technological Laboratory may

* "The Effect of different Spindle Speeds on the Results of Spinning Tests" by A. James Turner, Indian Central Cotton Committee Technological Laboratory, Bulletin No. 14, Technological Series No. 9, May 1928.

be rather too favourable to cotton spun into very coarse counts, and rather unfavourable to cotton spun into 40's counts. However, the difference in ring diameter is not likely to be of any great moment in these spinning tests, although it may assume importance when a cotton is being spun near the limit of its capacity for weft yarn."†

III. DETAILS OF FIBRE-TESTS.

In view of the fact that only a few grams of lint is all that is required for the fibre-tests, it is important that the sampling error should be reduced to a minimum. To ensure this the small sample used in the fibre-tests is obtained in this manner. Approximately half a pound of lint, taken from different parts of the bag containing the cotton is divided into eight nearly equal portions. Each portion is sampled in five or six different places, thereby giving forty to fifty small clusters of fibres which are then united into one mass. This is made into a sliver with the hand without using any machinery except a small draw-box which performs the function of parallelising the fibres and making the sliver uniform. This hand-sliver is used in all fibre-tests. In this way any possible damage to the fibres by the heavy machinery, employed in the cleaning or spinning of cotton, is avoided, and the properties determined are those of the raw material.

The manner of determining the various fibre properties is as follows :—

Mean fibre-length.—This is determined by two independent methods, viz., (1) the Balls Sorter method, (2) the Baer Sorter method. The results by one method serve as a check upon the other. Moreover, the Balls Sorter determination gives the distribution of fibres of different length-grades in the cotton. These are graphically presented in Figs. 1-21, which also show the seasonal variation in the fibre-length distribution. Four determinations are made with the Balls Sorter and eight with the Baer Sorter.

Fibre-weight per inch.—The values of fibre-weight per inch given in the earlier editions of this Report were found by the cutting method, which consisted of weighing, on a sensitive quartz micro-balance, a known number of fibres, each cut into 1cm. length. This method is open to two objections. In the first place, it is possible that the fibre-weight per inch of fibres of different lengths is different to such an extent as to affect the mean value of fibre-weight. This point was investigated and it was concluded that although it cannot be accepted as universally true that the fibre-weight per inch is the same for different lengths of fibre of a given cotton, yet the effect of variation of fibre-weight with fibre-length upon the mean fibre-weight is not sufficient to make this essentially different from the value obtained by the cutting method.‡ The second objection lies in the possibility of the fibre-weight per unit length being variable along the length of the fibre. In the cutting method a bunch of fibres is straightened out and 1-cm. lengths, taken from its middle portion, are weighed. It will be readily seen that this method will only give the correct value for the whole fibre if the fibre-weight per inch is constant along the length of the fibre. If the central portion weighs more than the end portion, per unit length, the result by the cutting method will be too high, and, *vice versa*, if it weighs less, the result will be too low. This point has also been investigated for standard cottons of two seasons 1927-28 and 1928-29, and the results will soon be published in a separate bulletin. Independently, the fibre-weight per inch has been determined for all the standard cottons of 1929-30 season

† The results of some "Tests to determine the Effect of Humidity, Ring Size and Spindle Speed on the Strength of Yarn" by J. J. W. Cooper, published in "Miscellaneous Scientific Papers of F. P. Sheldon and Son", 1926, Providence, R.I., U.S.A., indicate that a certain cotton mixing spun into 28's nominal counts with a twist-constant 4.75, gives practically the same strength results (count-strength product of more than 1,500 at 70 per cent. relative humidity) whatever the size of the rings between the limits 1½-2½ inches.

‡ "The weight per inch of fibres of different lengths and the numbers of different lengths per seed for each of the standard Indian cottons" by R. L. N. Iyengar and A. James Turner, Indian Central Cotton Committee, Bulletin No. 7, Series B.

by both methods and the results of these determinations are given in the following table:—

Name of Cotton.	1929-30		
	a.	b.	$C = \frac{100(a-b)}{(b)}$
Dharwar 1	2.09	1.90	10.0
Jayawant	2.24	1.90	17.9
Gadag 1	1.66	1.48	12.2
Surat 1027 A.L.F.	1.86	1.80	3.3
Wagād 8	2.08	1.95	6.7
Punjab-American 4F	1.79	1.55	15.5
Punjab-American 289F	1.47	1.42	3.5
Mollisoni	2.98	2.72	9.6
A. 19	3.14	2.77	13.4
K. 22	2.29	2.10	9.0
J. N. 1	2.37	2.29	3.5
C. A. 9	1.74	1.65	5.4
Verum 262 (Nagpur)	1.90	1.66	14.5
Verum 262 (Akola)	1.95	1.76	10.8
Umri Bani	1.72	1.52	13.2
Co. 1 (Cambodia 295)	1.75	1.46	19.9
Co. 2 (Cambodia 440)	1.72	1.36	26.5
Nandyal 14	1.90	1.69	12.4
Hagari 1	1.92	1.75	9.7
Hagari 25	2.08	1.78	16.8
Karunganni C7	1.96	1.81	8.3
Mean			11.5

(a) Fibre-weight (10^{-7} oz.) per inch obtained by cutting 1-cm. lengths at 70% R. H.

(b) Fibre-weight per inch obtained by weighing whole fibres at 70% R. H.

It will be seen that in every case the fibre-weight per inch as determined by the whole-fibre method is *less* than by the cutting method, the percentage differences ranging from 3.3 to 26.5 with an average value of 11.5. This has necessitated a change in the method of determining the fibre-weight per inch. This value is now found in the following manner. Bunches of whole fibres, each containing 100-150 fibres, are weighed on a quartz micro-balance. The number of fibres in each bunch is such that the deflection is approximately the same as given by 0.5 mgm. If the weight of the whole fibre is small, the number of fibres in a bunch will be about 150; if it is large, the number will lie close to 100. This null method obviates the necessity of calibrating the balance along the entire length of the scale. Altogether some 4,000 fibres are weighed in this manner in 28 to 40 bunches, according to the number in each bunch. Knowing the total number of fibres weighed and the mean fibre length, it is a simple matter to calculate the weight of a fibre per inch of its length. The values of fibre-weight per inch given in the tables of fibre particulars are as determined by the cutting method up-to the season 1928-29, and by the whole-fibre method in the subsequent seasons. In following the seasonal variation in the fibre-weight per inch of the cottons across this boundary line of seasons, it should be remembered that the whole-fibre method gives, on the average, some 10 per cent. lower values than the cutting method. The probable error of a single observation of fibre-weight lies between 3 and 6 per cent. for most Indian cottons.

The fibre-weight as determined above has to be corrected for humidity. The variation in temperature in the Laboratory is small, and no correction is regarded necessary on this account. In the present report all the values

of fibre-weight per inch have been corrected to 70 per cent. relative humidity by using the appropriate correction-factors shown in the following table, which is based upon the results obtained by Urquhart and Williams*.

Humidity Correction-factors for Fibre-weight.

Relative humidity.	30	40	50	60	70	80
0	1.048	1.038	1.027	1.014	1.000	0.981
1	1.047	1.036	1.025	1.012	0.999	0.979
2	1.046	1.035	1.024	1.011	0.997	0.976
3	1.045	1.034	1.023	1.010	0.996	0.973
4	1.044	1.033	1.022	1.009	0.994	0.970
5	1.043	1.032	1.020	1.007	0.992	0.968
6	1.042	1.031	1.019	1.006	0.990	0.965
7	1.041	1.030	1.018	1.004	0.988	0.961
8	1.040	1.029	1.017	1.003	0.986	0.957
9	1.039	1.028	1.015	1.002	0.984	0.953

Determinations of fibre-weight are not made when the relative humidity is 90 per cent. or more.

Fibre-strength.—The mean fibre-strength is determined by two methods, viz., (1) the Balls Magazine Hair Tester; and (2) the O'Neill Tester, as modified by Mann and Pierce†. 300 fibres are tested by each method. The probable error of a single observation for most Indian cottons lies between 30 and 40 per cent.

The strength of a cotton fibre is also affected by the atmospheric conditions of humidity. As in the case of the fibre-weight, the values actually determined are corrected to 70 per cent. relative humidity by using the correction-factors shown in the following table, which is based upon results obtained at the Technological Laboratory.

Humidity Correction-factors for Fibre-strength.

Relative humidity.	40	50	60	70
0	1.176	1.111	1.053	1.000
1	1.170	1.105	1.047	0.995
2	1.163	1.099	1.042	0.990
3	1.156	1.093	1.036	0.985
4	1.149	1.087	1.031	0.980
5	1.143	1.081	1.026	0.976
6	1.136	1.075	1.020	0.976
7	1.130	1.070	1.015	0.976
8	1.124	1.064	1.010	0.976
9	1.117	1.058	1.005	0.976

The correction-factor for relative humidities above 75 per cent. is taken as the same as that for 75 per cent. relative humidity and no determinations of fibre-strength are made when the relative humidity is above 85 per cent.

* Journal of the Textile Institute, XVII, 1926, page T 38.

† Journal of the Textile Institute, XVII, 1926, page T 84.

Fibre-rigidity.—As the rigidity of cotton fibre is extremely susceptible to changes in humidity, the fibres are kept in a closed box in which the relative humidity is maintained constantly at 70 per cent. by means of a solution of calcium chloride, 100 parts of which contain 27 parts by weight of anhydrous sodium chloride. Each fibre supports a small aluminium rod, half an inch long and weighing 0.0178 gramme (0.00063 oz.) which is suspended horizontally at its mid-point. The time of oscillation of the rod is noted, and, knowing its moment of inertia, the fibre-rigidity can be readily calculated. The value for each sample is the mean of tests on 150 fibres and the probable error of a single observation lies between 40 and 80 per cent. for most Indian cottons.

Ribbon-width.—The ribbon-width is measured under the microscope at a point practically midway between two convolutions of the fibre. Ten observations are made on each fibre and, in all, 150 fibres are examined in this manner. The value of ribbon-width for each sample is therefore the mean of 1,500 observations. The probable error of a single observation, as estimated for a few Indian cottons, appears to lie between 7 and 9 per cent. In the 1923-26 seasons only 50 fibres of each cotton were examined for ribbon-width.

Convolutions or natural twist.—The number of convolutions is obtained from measurements under the microscope on 150 fibres of each cotton. The probable error of a single observation, for these measurements, lies between 20 and 30 per cent. for most Indian cottons. Before 1925-26, measurements of number of convolutions were limited for each cotton to 50 fibres.

It is the practice at the Technological Laboratory to make successive tests for the number of convolutions, the ribbon-width and the fibre-rigidity on the same 150 fibres. As the probable error of a single observation in the case of the fibre-rigidity and the number of convolutions is fairly large, their mean values should be regarded as approximate and liable to considerable sampling error.

Size of a satisfactory sample for fibre-tests.—The question may be put as to what is the minimum number of tests, for each fibre property, which will yield a satisfactory result. This problem has been investigated experimentally at the Technological Laboratory in a very thorough manner. The results and the conclusions of the investigation will be found in a series of Technological bulletins entitled "Studies in the Sampling of cotton for the Determination of fibre-properties." The following table, which is taken from Part III of this series,* shows the degree of reliability which can be placed on the mean value of a given number of observations for each of the fibre-properties.

Range (% of Mean) for which the Odds are as shown that the Mean of a Random Sample will lie therein.

Fibre property.	Odds.	Size of Sample.				
		200	300	400	500	600
Fibre-length	20:1	18	16	13	11	9
Fibre-width	20:1	4	2.7	2	..	..
Convolutions	20:1	30	24	20	19	18
Fibre-strength	20:1	40	23	17	15	13
Fibre-rigidity	5:1	..	60	55	48	44

* "The size and reliability of a satisfactory sample" by Ram Saran Koshal and A. James Turner Indian Central Cotton Committee Technological Laboratory, Bulletin No. 10, Series B.

It will be seen from the table that the odds are 20:1 that, in the case of ribbon-width, the mean of observations on 200 fibres, chosen at random, will lie within 2 per cent. on either side of the mean value for a large sample, while for the same odds and the same number of observations, the range of deviation is 15 per cent. on either side of the mean in the case of convolutions.

IV. DETAILS OF YARN TESTS.

All the spindles in the Technological Laboratory are numbered and the yarn bobbins spun on them are marked accordingly. The examination of yarn-characteristics of the standard cottons is restricted to bobbins marked 1 to 10 and 73 to 82 for the two lots respectively. Both these sets of spindles belong to the ring-frame No. 1. This is done with a view to reduce to a minimum possible variations in the quality of the yarn due to the 'spindle effect'. Thus, 10 bobbins are available for each count of each lot of a standard cotton.

The various yarn tests are made in the following manner :

Lea tests.—5 leas are taken from each bobbin; so that, for each count of either lot, the value given is the mean of 50 determinations. These tests are made by means of the Goodbrand Lea Tester No. 18, which is electrically driven and has a maximum load of 150 lbs. The rate of traverse of its lower grip is 12 inches per minute.

Ballistic tests.—The results of these tests are being included in this Report for the first time. The test itself consists of measuring the work of rupture of a lea (or half a lea) by means of a heavy pendulum which swings, against a graduated scale, in an arc of a circle. This principle is embodied in the Goodbrand's Ballistic Testing Machine, which is used in these tests. As the maximum reading on the machine is 150 inch-pounds which is often exceeded by the work of rupture of a full lea, only half leas are used in these tests. In view of the fact that the ends of the yarns are held fast to prevent slippage so that all the yarns are broken asunder, the work of rupture of a full lea is just double that of a half-lea. The value given against each count is the mean of 50 tests, viz., on 5 half-leas from each of the 10 bobbins, converted into that of a full lea by multiplying by two.

Single thread tests.—These tests are made on 20 single lengths of yarn, each 12 inches long, obtained from each bobbin, giving altogether 200 tests (250 for sample Nos. 1-73) for each count. In addition to the strength these tests also give the extensibility of the yarn, and, therefore, serve not only as a check upon the lea-test results, but provide additional information about an important property of the yarn. The machine employed is the Goodbrand's Single Thread Tester No. 20, which has a maximum load of 16.64 oz. and a rate of traverse of the lower grip of 12 inches per minute.

The relative merits of the three methods of determining the strength of yarns and the inter-relationship of their results are discussed fully in a separate bulletin.* It may be mentioned here that the lea test, though most commonly employed in practice, is open to serious objections. Firstly, in the subsequent operations of winding, warping, beaming, etc., the yarn is never used in the form of a lea or hank, the only noteworthy exceptions being hank sizing, hank bleaching, hank mercerising and hank dyeing. Secondly, it gives no indication of the extensibility and elastic properties of a yarn, which are of great importance, particularly in the weaving operations. Thirdly, the breakage of a single yarn, at a weak place, affects the result of the whole lea, which is contrary to what we have in actual practice in warping, beaming, weaving, etc., where the yarns are individually subjected to strain and the rupture of one yarn leaves the others unaffected. These objections are to some extent absent in the single thread tests, but here, unfortunately, on account of the very short length of the yarn tested, there is a large sampling error. This will be seen from the

* "A Study of Comparative Results for Lea, Single Thread and Ballistic Tests on Yarns from Standard Indian Cottons" by A. James Turner and V. Venkataraman, Indian Central Cotton Committee, Technological Bulletin No. 12, Series B.

following illustration. The total length of yarn on a bobbin containing say $1\frac{1}{2}$ oz. of 20's yarn is 1,500 yards. Of this 600 yards are tested in 5 lea tests, while only 7 yards are required for the single thread test. The ballistic test does certainly involve much less sampling error than the single thread test, and has also the advantage of taking into account the elastic properties of the yarn; but there is no discrimination between the extension within the elastic limit, which really matters, and the extension beyond it, which is relatively unimportant. On the whole, therefore, it may be said that, in the present state of our knowledge, all the three tests are useful inasmuch as they supplement each others' results.

Counts actual.—The leas and half-leas, used in the lea and the ballistic tests respectively, are weighed individually on an Avery Yarn Balance for actual counts determination. In each case therefore the value of actual counts given in the tables represents the mean of 50 determinations. The 1-foot lengths used in the single thread tests are weighed collectively for each bobbin on a torsion balance, giving thereby the average count of the yarns used in these tests.

Twist.—The actual number of turns per inch is determined by means of the Baer Twist Tester No. 8, on 10-inch lengths of grandrelle yarns made on top of each test bobbin after the cotton under test has been spun thereon. As 10 lengths are examined from each bobbin, the value for any single count is the mean of 100 observations.

Evenness.—The evenness of a yarn is an important asset, as an uneven yarn, even of requisite strength, will produce an unsatisfactory fabric. The degree of evenness is estimated by the eye by winding the yarn on suitable blackboards, and is expressed by means of a numeral indicating one of the following nine classes:

1. Very even.
2. Very even to even.
3. Even.
4. Even to fairly even.
5. Fairly even.
6. Fairly even to uneven.
7. Uneven.
8. Uneven to very uneven.
9. Very uneven.

Neppiness.—The number of neps present in the yarn is counted at the same time as it is examined for evenness. The count is made on forty portions of yarn, each 3.6 inches long, the portions being taken from each of four bobbins, and the neppiness is expressed as the average number of neps per yard of yarn.

Irregularity.—In addition to the above characteristics which are directly measured or estimated, two characteristics are calculated from the results. The first is the percentage irregularity which represents the extent of variation or dispersion of the individual observations relating to any single property of yarn, such as lea strength. This is obtained by subtracting from the mean the average of all the results which are less than the mean, dividing this difference by the value of the mean, and multiplying the fraction by 100. Its importance will be realised when we remember that in many operations it is not the average strength or average extension which matters so much as the proportion of 'weak spots', where breakage is likely to occur and to which the percentage irregularity is a guide.

As it is not easy to visualize irregularity, a second statistical measure named "weakness percentage" has been introduced. This represents the percentage of the results for single-thread strength which are less than three-quarters of the average strength. This measure will be found easier to grasp by practical men.

Yarn breakages in the ring frame.—The strength, extensibility, evenness, and neppiness of a yarn are qualities which come into prominence when the cotton has actually been spun. But the behaviour of a cotton in the spinning process is also a matter of considerable importance, especially from the economic point of view. If the number of yarn-breakages in the ring frame is excessive, the cotton is spinning badly and will need more than its due share of attendance on the part of the operatives. The number of yarn-breakages in the ring frame, expressed as per 100 spindles per hour, for each count of each sample, is incorporated in the table of spinning particulars. Additional information regarding the behaviour of a cotton in spinning is given in the Spinning Master's report.

V. STANDARDS OF TWIST AND STRENGTH.

Twist standards.—In a given count the strength of the yarn will depend, to an appreciable extent, upon the twist inserted. It is a well-known fact that the strength of a yarn at first increases with the number of turns per inch, attains a maximum value and then steadily diminishes. In order to maintain a uniform basis of comparison it is, therefore, necessary to have certain standards of twist. In the Technological Laboratory the standards selected are those represented by the twist constants* 3.75, 4 and 4.25, which correspond to a medium degree of twist.

For the preliminary tests, a cotton is spun, with 4 twist constant, in either 20's or 10's counts, according to its quality and, on the results of this test, the appropriate counts in which the cotton is to be finally spun, are decided. In the selection of these counts due regard is paid to the spinning value of the cotton. Before 1929-30 the 20's yarns were generally spun with 3.75 twist constant, but as the practice in most Indian mills is to spin 20's yarns with 4 twist constant, they are now spun, for the most part, with both twist constants. This modification, although it entails 4 instead of 3 spinnings, brings the practice at the Laboratory into harmony with the general mill practice, ensures continuity of results, and gives an indication of the effect on yarn-strength of increasing the twist. Finally, it may be mentioned that in general the 4.25 twist constant is used in the spinning of 40's counts only.

Strength standards.—Various standards of lea strength have been proposed from time to time for different counts of moderately twisted warp yarn. Although these standards are more or less arbitrary, they nevertheless take into account the average quality of the types of cotton, to which they are intended to apply. The standards adopted at the Technological Laboratory, together with the corresponding count-strength products, are shown in the following table :

Table of Strength Standards for Various Counts.

Count.	Breaking Strength.	Count-Strength Product.
Up to 14	90	1,260
16	81	1,296
18	73	1,314
20	67	1,340
22	62	1,362
24	58	1,394
26	54	1,404
28	51	1,428
30	48	1,440
32	46	1,472
34	44	1,496
36	42	1,512
38	40	1,520
40	39	1,560

* The twist constant is a factor which, when multiplied by the square root of the counts being spun, gives the number of turns per inch.

A yarn spun with moderate twist and having the lea strength specified in the above table for its count will be referred to as "standard warp" yarn.

It will be seen from the table that the breaking strength for 40's yarn is more than half as much as for 20's yarn and that the count-strength product increases steadily with the count of the yarn. Now, in actual practice, this is never the case for any single cotton. If the breaking strength of 20's yarns of a medium quality cotton is 67 lbs., the breaking strength of its 40's yarns will be considerably less than 39 lbs. and *vice versa*, if a good quality cotton gave 39 lbs. as the breaking strength for its 40's warp, the breaking strength of its 20's warp will be much more than 67 lbs. If the cotton be spun in more than one count, the count-strength product will actually be found to decrease with increasing count. The scale therefore is hypothetical and does not refer to the behaviour of any one cotton.

It follows, then, that a cotton capable of yielding 20's standard warp yarn will give 30's or 40's yarns having less breaking strength than that specified in the scale. In other words, in order to produce finer yarns which should conform to the standards of strength adopted, cotton of a better quality should be used. The reason for this is obvious. Fine yarn is meant for better class of fabrics and has to bear in the weaving process relatively more tension than coarse yarn. If fine yarn is prepared from a comparatively low class of cotton, then, on account of the excessive warp breakages and the consequent piecings, the manufacture of the fabric will be uneconomical, its appearance uninviting, and its quality poor.

VI. THE SPINNING VALUE OF A COTTON.

The method of indicating the spinning value of a cotton in terms of the above scale will be clear from the accompanying diagram, Fig. A. It has already been stated that while the standard values of count-strength products are in the ascending order of magnitude, the values actually found for any one cotton are in the descending order of magnitude. Consequently if the two sets of values are plotted on the same graph, with counts as abscissæ and count-strength products as ordinates, the two lines—one rising upwards, the other sloping downwards—are bound to intersect. The particular value of the count, given by this point of intersection, is taken as a measure of the spinning value of the cotton and is termed "the highest standard warp count" for which the cotton is suitable. Thus referring to the diagram it will be seen that the highest standard warp counts obtained by this method, for the Memphis and the Punjab-American cottons, spun with twist constant—4, are 39's and 25's respectively.

It must not be concluded that it is not possible to spin a cotton into a count higher than the highest standard warp count assigned to it without necessarily diminishing the strength of its yarns. It has already been mentioned that the strength of a yarn depends not only upon the quality of its material and the treatment given to it but also upon the twist inserted in spinning. The relationship between twist and yarn-strength has been investigated at the Technological Laboratory for two Indian cottons and the results will be found in a separate bulletin*. For the purpose of these tests all that is meant by the statement that a cotton is suitable for a given highest standard warp count is that the yarns of that cotton, spun into the assigned count with twist constant 4, will give the breaking strength corresponding to that count in the preceding table.

*Technological Bulletin Series A, No. 17. (Limit Spinning Tests on Cambodia and Mollisoni Cottons by R. F. Richardson and A. James Turner).

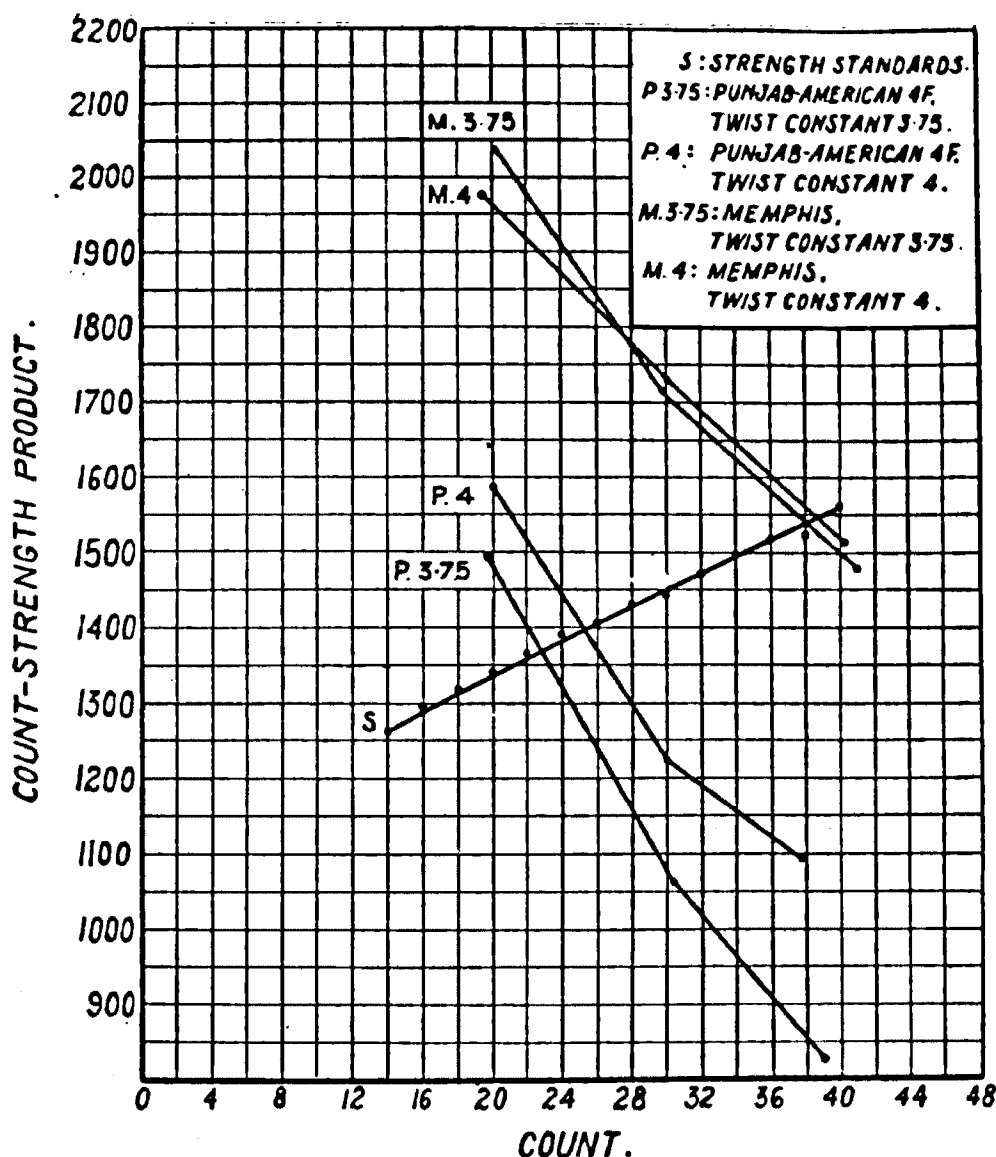


Fig. A. RELATION BETWEEN COUNTS AND COUNT-STRENGTH PRODUCTS.

This method of indicating the spinning value of a cotton has certain advantages over the alternative method of expressing it directly in terms of the breaking strength of yarns of any one count. In the first place it is not easy to choose any single count which should be suitable for all the different varieties represented by the standard cottons. If a low count is selected, it would hardly be fair to the long staple cottons; on the other hand if a relatively high count is decided upon, it would be expecting too much from the short staple cottons. The method adopted here is, therefore, of much more general application, as it is equally suitable to long and short stapled types of Indian cottons. Secondly, it is more precise and yet better adapted to reveal finer shades of difference between the spinning value of two cottons.

VII. PHYSICAL CONDITIONS.

Complete records are maintained at the Technological Laboratory of atmospheric conditions of humidity and temperature prevailing at the time of different processes. But as the inclusion of all these figures would make the tables unwieldy, only the average humidity and temperature prevailing in the spinning and the yarn testing sections are shown.

VIII. PRESENTATION OF RESULTS.

The general plan of the reports has already been described. It remains only to mention that in the tables 1-21 the results for the 1930-31 cottons are given for both the lots, while for the earlier cottons the average figures for the two lots are given. The wastes are shown against 20's (or 10's) counts, but as the same rovings are used in the preparation of all the three or four counts, in which a cotton is spun, it follows that the blow-room loss and the card-room loss would be the same for any of the other counts. The figures for "spinning loss", however, refer to the total loss in the spinning of all the counts.

The reports are brought to a close by two tables giving the summary of results for all the standard cottons tested in the different seasons. Table 22 gives the results of fibre tests made on standard cottons since 1926-27. Table 24 contains the spinning-test results, since 1923-24, for a standard count (20's wherever possible) spun with standard twist. During the first season a number of lots, including one 10 lb. lot, were used for most cottons. The waste percentage for this season refers to the single 10 lb. lot, but the other particulars are the mean values for the 10 lb. and the 100 lb. lots.

IX. SEASONAL VARIATION OF STANDARD COTTONS.

The seasonal variations of the fibre-properties and the spinning value of a cotton are discussed in the "Remarks" section. The following three tables contain the summary of results for (1) mean fibre-length, (2) fibre-weight per inch, and (3) highest standard warp counts. In each table the cottons are divided into three classes according to the following criteria of variability.

Fibre-length :	Slightly variable : below 2 per cent. Variable : 2-3 per cent. Very variable : above 3 per cent.
Fibre-weight per inch :	Slightly variable : below 6 per cent. Variable : 6-10 per cent. Very variable : above 10 per cent.
Highest standard counts :	Slightly variable : below 6 per cent. Variable : 6-10 per cent. Very variable : above 10 per cent.

Seasonal Variation in Fibre-Length.

Cotton.	Province or State.	Mean Fibre-Length (inch.)									Grand Mean (inch.)	Coefficient of Seasonal Variation (%)
		1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.			
I.—Slightly Variable.												
Dharwar 1 ..	Bombay ..	0.88	0.88	0.89	0.89	0.89	0.87	0.87	0.86	0.879	1.20	
C. A. 9 ..	United Provinces ..	..	0.89	0.87	0.87	0.86	0.89	0.87	0.86	0.873	1.33
J. N. 1 ..	" ..	..	0.78	0.77	0.77	0.74	0.76	0.75	0.76	0.761	1.64
Karunganni C7 ..	Madras ..	..	0.84	0.83	0.85	0.85	0.81	0.83	0.82	0.833	1.66
Umri Bani ..	Hyderabad ..	..	0.85	0.83	0.81	0.81	0.83	0.81	0.80	0.820	1.96
II.—Variable—												
Cambodia Co. 2 ..	Madras ..	..	0.91	0.92	0.94	0.88	0.92	0.89	0.92	0.911	2.07
P. A. 289F ..	Punjab ..	..	1.01	1.00	0.97	0.94	0.96	1.00	0.96	0.977	2.20
Wagad 8 ..	Bombay ..	..	..	0.79	0.80	0.77	0.80	0.75	0.78	0.782	2.27
P. A. 4F ..	Punjab ..	..	0.80	0.81	0.78	0.79	0.76	0.81	0.77	0.789	2.29
Nandyal 14 ..	Madras ..	0.90	0.89	0.88	0.93	0.88	0.91	0.91	0.86	0.895	2.30	
1027 A.L.F. ..	Bombay ..	1.00	0.95	0.92	0.97	0.94	0.96	0.97	0.94	0.956	2.39	
Mollisoni ..	Punjab ..	..	..	0.71	0.68	0.73	0.69	0.69	0.69	0.698	2.40
III.—Very Variable—												
Cambodia Co. 1 ..	Madras ..	0.91	0.86	0.91	0.92	0.93	0.93	0.89	0.87	0.902	3.19	
A. 19 ..	United Provinces ..	..	0.71	0.72	0.66	0.70	0.71	0.68	0.66	0.691	3.32
Gadag 1 ..	Bombay ..	0.89	0.81	0.82	0.81	0.86	0.82	0.84	0.87	0.840	3.60	
Hagari 1 ..	Madras ..	..	0.86	0.82	0.81	..	0.84	0.84	0.91	0.847	3.84
K. 22 ..	United Provinces ..	..	0.79	0.80	0.73	0.75	0.78	0.70	0.76	0.759	4.31
Hagari 25 ..	Madras ..	0.90	0.86	0.85	0.76	0.87	0.90	0.86	0.90	0.862	5.02	

Seasonal Variation in Fibre-Weight per Inch.

Cotton.	Province or State.	Mean Fibre-Weight per inch (10 ⁻⁶ oz.)						Grand Mean (10 ⁻⁶ oz.) (1923-29)	Coefficient of Seasonal Variation (%) (1923-29)	Mean Fibre-Weight per inch (10 ⁻⁶ oz.)	
		1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.			1929-30.	1930-31.
I.—Slightly Variable.											
J.N. 1 ..	United Provinces ..	..	0.243	0.237	0.242	0.226	0.236	0.237	2.6	0.229	0.218
Umri Bani ..	Hyderabad ..	..	0.184	0.184	0.200	0.192	0.185	0.189	3.3	0.152	0.175
A. 19 ..	United Provinces ..	..	0.287	0.303	0.301	0.305	0.324	0.304	3.9	0.277	0.301
Nandyal 14 ..	Madras ..	0.198	0.179	0.176	0.191	0.196	0.187	0.188	4.3	0.169	0.167
Dharwar 1 ..	Bombay ..	0.202	..	0.186	0.204	0.202	0.182	0.195	4.8	0.190	0.164
Cambodia Co.1 ..	" ..	0.171	0.147	0.156	0.155	0.164	0.170	0.160	5.4	0.146	0.156
Karunganni ..	" ..	..	0.164	0.173	0.192	0.183	0.186	0.180	5.5	0.181	0.161
II.—Variable—											
K. 22 ..	United Provinces ..	..	0.211	0.210	0.240	0.244	0.225	0.226	6.3	0.210	0.196
Gadag 1 ..	Bombay ..	0.174	0.154	0.150	0.179	0.167	0.162	0.164	6.3	0.148	0.153
1027 A.L.F. ..	" ..	..	0.204	0.237	0.200	0.207	0.204	0.210	6.4	0.180	0.201
C. A. 9 ..	United Provinces ..	..	0.163	0.147	0.162	0.176	0.166	0.167	7.2	0.165	0.154
Mollisoni ..	Punjab ..	..	..	0.321	0.272	0.335	0.303	0.308	7.6	0.272	0.287
Hagari 25 ..	Madras ..	0.210	0.172	0.178	0.177	0.205	0.188	0.188	7.7	0.178	0.195
Cambodia Co.2 ..	" ..	..	0.172	..	0.168	0.141	0.148	0.167	8.3	0.136	0.133
III.—Very Variable—											
289F ..	Punjab ..	..	0.125	0.125	0.098	0.142	0.122	0.122	11.6	0.142	0.142
4F ..	" ..	..	0.177	0.174	0.134	0.186	0.197	0.174	12.3	0.155	0.198
Wagad 8 ..	Bombay ..	..	..	0.258	0.264	0.189	0.239	0.237	12.4	0.195	0.257
Hagari 1 ..	Madras ..	..	0.171	0.146	0.209	..	0.207	0.183	14.4	0.175	0.166

Seasonal Variation in Highest Standard Warp Counts.

Cotton.	Province or State.	Highest Standard Warp Counts.								Grand Mean.	Coefficient of Seasonal Variation (%)
		1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.		
I.—Slightly Variable.											
Nandyal 14 ..	Madras ..	34	32	32	34	31	31	35	35	33.0	4.8
A. 19 ..	United Provinces ..	..	7	8	7	7	7	7	7	7.1	5.0
Dharwar 1 ..	Bombay ..	34	34	34	34	32	34	30	30	32.7	5.2
II.—Variable—											
J. N. 1 ..	United Provinces ..	..	12	12	14	14	13	12	12	12.7	6.9
K. 22 ..	" ..	..	12	12	12	12	14	11	12	12.1	6.9
1027 A.L.F. ..	Bombay ..	30	32	26	32	30	32	34	29	30.6	7.5
Cambodia Co.1 ..	Madras ..	32	20	32	38	34	32	34	29	32.6	7.9
Karunganni C7 ..	" ..	..	26	26	24	24	20	23	26	24.1	8.4
Umri Bani ..	Hyderabad ..	..	22	24	24	24	22	27	28	24.4	8.7
III.—Very Variable—											
Mollisoni ..	Punjab ..	..	..	6	8	8	7	8	8	7.5	10.2
Wagad.8 ..	Bombay ..	..	..	12	14	15	15	12	12	13.3	10.3
P. A. 289F ..	Punjab ..	..	34	32	40	42	39	42	44	39.0	10.5
P. A. 4F ..	" ..	..	22	22	24	..	16	20	22	21.1	11.2
Hagari 1 ..	Madras ..	..	30	30	27	..	24	27	36	29.0	12.9
C. A. 9 ..	United Provinces ..	..	28	28	34	30	40	34	37	33.0	12.9
Cambodia Co.2 ..	Madras ..	..	29	25	37	33	26	28	29	29.6	13.0
Hagari 25 ..	" ..	..	24	28	26	26	30	25	36	27.6	13.1
Gadag 1 ..	Bombay ..	..	36	20	30	38	38	26	32	31.9	18.6

As regards the table of fibre-weight per inch it may be mentioned that the grand mean and the coefficient of seasonal variation are calculated only up to 1928-29. On account of the change in the method of determination of this property, which has already been described, the values in the subsequent seasons are not strictly comparable with earlier values and are, in themselves, too few to justify calculation of this nature.

It will be seen that there is hardly any correspondence between the degrees of variability of these three properties, the only notable exceptions being Dharwar 1 and Nandyal 14 in the "slightly variable" class, 1027 A.L.F. in the "variable" class, and P.A. 289F. in the "very variable" class. It will also be noticed that although there have been considerable fluctuations in the highest standard warp counts of the standard cottons, yet, in no case, there is definite evidence of deterioration of type within the period concerned.

X. STANDARD COTTONS OF 1930-31.

The detailed results for these cottons will be found in the respective Technological reports. A few general remarks may be made here, especially with reference to their performance in this season as compared with the last season. We find that, on the whole, the standard cottons of 1930-31 have done better than those of 1929-30. This will be readily seen from the following list in which those cottons which have given a higher spinning value in 1930-31 (as shown by the highest standard warp count) are entered in column 1, those for which the spinning value remains the same in column 2, and those for which the spinning value is less in column 3.

LIST.

Improved.	Same.	Poorer.
Hagari 25	Dharwar 1.	Cambodia Co. 1.
Hagari 1	Nandyal 14.	Surat 1027 A.L.F.
Nagpur Verum.	Wagad 8.	Akola Verum.
Gadag 1.	Aligarh A. 19.	Jayawant.
Cawnpore-American C. A. 9.	Bundelkhand J. N. 1.	
Karunganni C7.	Mollisoni.	
Punjab-American 289F.		
Punjab-American 4F.		
Umri Bani.		
Cawnpore K. 22.		
Cambodia Co. 2.		

It will be seen that out of 21 cottons, 11 have shown an improvement, 6 have remained stationary while 4 have suffered a set-back. The most remarkable cases of improvement are those of Hagari 1 and Hagari 25. Last season these two cottons were found suitable for 27's and 25's highest standard warp counts respectively. The mean value for the two cottons, for all the seasons up to 1929-30, is about 27's, with 30's as the highest hitherto obtained. Yet this season both of them are found suitable for highest standard warp counts of 36's—a jump of 38 per cent. over the last season's value and of 33 per cent. over the average of all the preceding seasons. Another case which deserves special mention is of Verum 262 (Nagpur). This cotton, the cultivation of which is being rapidly extended in the Central Provinces, was found suitable for 26's standard warp counts up to 1928-29. Last year there was a sudden drop by 5 units in its spinning value. This year the cotton has recovered and is again found satisfactory for 26's standard warp. Another improved variety, Jayawant, which was found suitable for 38's standard warp during the first three seasons and then suddenly dropped down to 32's, is still on the downward trend, having been found suitable for 30's standard warp in the current season. Lastly mention may be made of Punjab-American 289F. Since 1926-27 this has given very good spinning value, but, unfortunately, its yarns have suffered seriously from neppiness. This year's sample was not only an improvement upon its predecessors as regards spinning value, but gave yarns which are only slightly neppy.

1.—DHARWAR 1 (KUMPTA).

Seasons ..	}	1923-24 (Sample No. 62).
		1924-25 (Sample No. 72).
		1925-26 (Sample No. 128).
		1926-27 (Sample No. 245).
		1927-28 (Sample No. 373).
		1928-29 (Sample No. 497).
		1929-30 (Sample No. 733).
		1930-31 (Sample No. 1055).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species.*—*Gossypium herbaceum*.
- (ii) *History.*—A pure line selection from Kumpta cotton, first grown on a field scale in 1914 (Reference: Bulletin No. 110, Bombay Department of Agriculture, and Memoir of the Department of Agriculture in India, Botanical Series, Vol. X, No. 6).
- (iii) *District of growth.*—The districts of Dharwar, Belgaum, Bijapur, and several Native States. The cotton used in these tests is from the fourth generation crop grown near Hubli from seed which has been multiplied for the first three generations on the Government Farm, Dharwar.
- (iv) *Growing period.*—Sown from the second week of August to the end of September, and picked from the second week of February up to the middle of April.
- (v) *Soil.*—Either deep black almost pure trap soil, or medium black soil (a mixture of trap soil with that derived from other soils).
- (vi) *Rainfall.*—From 25 to 30 inches annually.
- (vii) *Temperature.*—Average minimum about 60°F.
- (viii) *Plant particulars.*—
- Bolls per plant: 10 (spacing: 18" × 12").
 - Seeds per boll: 17.
 - Weight of seed: 53 milligrammes.
 - Weight of lint per seed: 19 milligrammes.
 - Ginning percentage: 29.
- (ix) *Yield of seed-cotton.*—Normally about 300 lbs. per acre. In 1930-31 the yield was only 140 lbs. per acre as the season was very unfavourable.
- (x) *Area under cultivation.*—
- | | | | |
|---------|----|---------|--------|
| 1923-24 | .. | 74,000 | acres. |
| 1924-25 | .. | 93,000 | " |
| 1925-26 | .. | 119,000 | " |
| 1926-27 | .. | 160,200 | " |
| 1927-28 | .. | 152,000 | " |
| 1928-29 | .. | 77,510 | " |
| 1929-30 | .. | 59,800 | " |
| 1930-31 | .. | 50,000 | " |

The above figures relate to the area under seed of known origin.

II.—GRADER'S REPORT.

	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under .. ..	..	..	..	Kumpta.	F. G. Broach.	Kumpta.	Kumpta.	Broach.
Class	Fine Western.	F. G. Western.	Superfine Western.	Good.	Good.	Fully Good.	Fully Good	Good.
Colour .. ..	..	..	Brownish.	Reddish.	Brownish.	Creamy.	Creamy to reddish.	Reddish.
Staple Length ..	7/8-1 inch.	7/8-15/16 inch	15/16-1 inch	15/16 inch	7/8-1 inch.	7/8 inch	1 inch.	3/4 inch.
Staple Strength..	Good.	Good	Good.	Good.	Good.	Good.	Good.	Fair.
Regularity ..	Regular.	Regular.	Regular.	Fair.	Regular.	Fair.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	..	Rs. 5 on.	Rs. 50 on.	Rs. 25 to 30 on.	Par	Rs. 40 on.
Basis .. ..	..	..	..	..	Rs. 308.	Rs. 354.	Rs. 300.	Rs. 175.
Date of Valuation .. ..	..	..	..	17-5-27.	17-4-28.	12-4-29.	24-5-30.	30-5-31.
Remarks .. ..	..	..	..	Premium for staple.	..	..	..	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	..	..	0.6	0.5	1.0	0.4	0.2	0.1
3	1.8	1.5	1.7	1.7	2.2	1.8	1.7	1.9
4	3.9	3.5	3.4	3.5	4.0	3.7	3.1	3.8
5	8.2	7.5	6.6	7.8	7.6	8.6	7.9	8.8
6	17.7	15.0	14.2	15.6	14.8	16.9	15.6	19.3
7	29.6	29.0	27.2	29.2	25.4	29.3	29.2	34.0
8	25.6	28.0	32.9	28.2	27.2	28.8	27.6	22.2
9	10.7	12.7	10.9	10.7	12.6	8.8	11.3	8.0
10	2.3	2.8	2.5	2.5	4.4	1.7	2.9	1.9
11	0.2	..	..	0.3	0.8	..	0.5	..
2. Fibre-Length (inch):—								
(a) By Balls Sorter ..	0.88	0.89	0.89	0.88	0.89	0.87	0.89	0.86
(b) By Baer Sorter ..	0.89	0.88	0.89	0.90	0.89	0.87	0.86	0.87
3. Fibre-Weight per inch (millionth of an ounce) ..								
..	0.202	..	0.186	0.204	0.202	0.182	0.190	0.164
4. Fibre-Strength (oz.):—								
(a) By Balls Tester ..	..	..	..	0.179	0.155	0.132	0.154	0.148
(b) By O'Neill Tester ..	..	..	..	0.158	0.149	0.127	0.170	0.137
5. Fibre-Strength per unit fibre-weight per inch ..								
..	..	..	..	0.82	0.75	0.71	0.85	0.87
6. Fibre-Rigidity (millionth of an ounce, square-inch) ..								
..	..	..	..	0.109	0.132	0.128	0.141	0.120
7. Ribbon-Width (thousandth of an inch) ..								
..	0.67	0.68	0.67	0.61	0.65	0.61	0.71	0.62
8. Convolutions per inch ..								
..	139	122	122	67	76	81	88	92

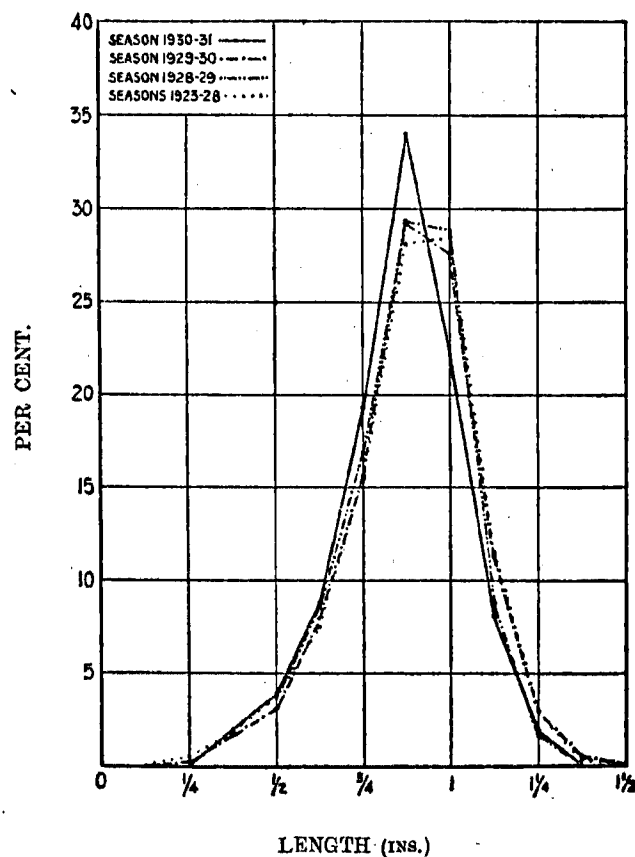


FIG. 1. Sorter Diagrams for Dharwar I (Kumpta).

IV.—SPINNING TESTS.

1. *Treatment*.—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1926-27 cotton was passed only once through the Crighton; otherwise its treatment was the same as that of the other seasons' cottons.
2. *Spinning Master's Report*:—
 - 1923-24 cotton: creamy; contains too much seed.
 - 1924-25 cotton: very dirty, containing seed, leaf, stalk, husk, and too much twine.
 - 1925-26 cotton: creamy and dullish; a little seedy and very leafy.
 - 1926-27 cotton: extra creamy and dull; leafy (very fine leaf) and sandy; feels a little rough; and contains too many full-ginned seeds (0.94 per cent.).
 - 1927-28 cotton: creamy to extra creamy in colour; dull; leafy and sandy; has a good feel; contains some cut seed and too much full-ginned seed (0.78 per cent.).
 - 1928-29 cotton: dull cream; too leafy; contains one per cent. seeds mostly ginned and cut seed; ginning has left the material slightly knotted; staple is fine, strong, and regular.
 - 1929-30 cotton: creamy to extra creamy; dull; contains very fine leaf and sand; ginning has left the lint in an open condition but has cut the seeds a good deal; the sample contains one per cent. ginned and unginned seeds. The staple is regular in length and strong, card sliver is clean and has a good-bodied feel; web is free of nep and shed the normal amount of fly; flat strips light in weight at 12.5 grams for 10 strips; a typical warp cotton.
 - 1930-31 cotton: dullish creamy; very leafy; fairly well-ginned; the card sliver is fairly clean; has a good feel; web is good and ten flat strips weigh 11.2 grams.
3. *Spinning Test Results*.—See Table 1, page 25.
 - Card Production for Sample 62:—11.9 lb. per hour.
 - Ring Frame Production for 40's, Sample 62:—2.43 oz. per spindle per 10 hours.

V.—REMARKS.

(i) *Fibre*.—The fibre-length is practically the same in each season. The fibre-weight per inch shows some variation, being rather low in 1925-26, 1928-29 and 1930-31. The fibre-strength is 30 per cent. higher in 1926-27 than in 1928-29; and the fibre-strength per unit fibre-weight per inch is lowest of all in 1928-29. The fibre-rigidity and the ribbon-width are rather low in 1926-27. The number of convolutions per inch varies a good deal, being very low in the two seasons 1926-28.

(ii) *Waste*.—Except in 1923-24 the samples of this cotton have given a fairly high blow-room loss. The card-room loss is slightly higher than usual in 1930-31.

(iii) *Breakages*.—Yarn-breakages in the ring-frame are comparatively few in all cases except 34's counts of 1929-30 cotton and 30's and 34's counts of the 1930-31 cotton.

(iv) *Yarns*.—The 20's yarns of this cotton are generally even, though in more than one season the cotton has given better yarns; the 34's yarns are fairly even. The 1926-27 yarns are exceptionally even. The yarns are usually free from neppiness, but the 1925-26 yarns are rather neppy. The yarn-strength results show but little variation, being comparatively low in 1929-30 and 1930-31.

(v) *Conclusion*.—This cotton does not show much variation with the season. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1923-24	..	34's.	1927-28	..	32's.
1924-25	..	34's.	1928-29	..	34's.
1925-26	..	34's.	1929-30	..	30's.
1926-27	..	34's.	1930-31	..	30's.

TABLE 1.—SPINNING TEST RESULTS FOR DHARWAR 1 (KUMPTA).

TRAVELLER COUNTS.

SPINDLE SPEED (1930-31).

HANK (1930-31).

Draw-frame .. 0.18
 Slubber .. 0.76
 Inter .. 1.72
 Rover .. 4.57

20^s .. 3/0
 30^s .. 7/0
 34^s .. 9/0

20 A .. 9,350 r.p.m.
 20 B .. 9,700 r.p.m.
 30 .. 9,700 r.p.m.
 34 .. 9,450 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS. *				YARN TEST RESULTS.											TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).								
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Counts-Strength Product.	Counts Actual.	Work of rupture (inch-lbs.)	Work Irregularity (%)	Counts-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)		Weakness Percentage.	Extension (%)	Extension Irregularity (%)				Evenness Class.	Neps per yard.	Turns per inch Actual.
62	1923-24	18-9-25	20A	6.4	7.8	0.7	14.3	0	183	4.49	16.85	19.7	97.5	4.7	1,921	..	..	..	..	..	10.7	9.6	2.4	4.2	16.5	2	1.2	..	86	79	59
72	1924-25	30-10-25	..	14.7	8.7	0.9	22.7	32	183	4.39	16.85	19.1	100.2	4.7	1,914	..	..	..	..	..	13.6	7.1	0	4.4	10.0	2	1.2	..	83	79	61
128	1925-26	17-5-26	..	12.2	7.1	0.4	18.8	7	182	4.60	16.85	19.6	90.6	4.9	1,776	..	..	..	..	..	11.7	8.5	0.5	6.1	10.7	3	4.0	..	90	63	60
245	1926-27	6-6-27	..	12.6	7.4	0.3	19.3	2	190	4.35	16.85	19.0	98.6	5.0	1,873	19.1	13.3	10.2	1.7	7.1	7.5	1	1.9	16.2	91	65	78
373	1927-28	18-4-28	..	13.0	8.0	0.1	20.0	2	191	4.33	16.85	20.0	88.7	5.6	1,774	20.2	12.3	12.1	4.5	6.6	8.5	3	2.7	16.2	88	65	69
497	1928-29	12-4-29	..	14.0	8.8	0.3	21.9	5	192	4.39	16.85	20.1	91.2	3.5	1,833	20.0	129.2	3.1	2,584	20.5	12.1	8.6	1.0	7.3	8.2	2	1.4	16.3	88	64	70	
733	1929-30	14-5-30	..	13.1	7.8	0.3	20.2	12	200	4.65	16.85	19.8	87.5	5.9	1,732	20.0	118.3	2.9	2,366	20.8	11.1	10.7	2.2	6.6	8.9	3	2.2	16.3	90	59	61	
1055/1	1930-31	21-5-31	..	13.3	8.6	0.6	21.2	10	197	4.43	16.85	19.9	82.6	7.4	1,644	20.1	126.4	3.2	2,541	19.6	12.0	12.6	4.0	8.3	7.3	3	2.2	16.1	90	68	69	
1055/2	..	..	..	13.7	9.1	0.7	22.1	15	197	4.43	16.85	19.8	85.9	4.8	1,701	20.1	128.2	3.7	2,577	20.1	12.4	10.2	2.0	7.9	7.7	3	1.5	16.3	90	68	70
733	1929-30	15-5-30	20B	..	..	..	..	10	198	4.65	17.98	19.6	93.4	3.5	1,851	19.9	124.3	3.5	2,473	20.1	12.4	10.6	3.0	6.8	7.2	3	2.2	17.3	90	59	62
1055/1	1930-31	21-5-31	..	..	..	..	..	15	198	4.53	17.98	19.9	87.3	4.3	1,737	20.4	125.4	3.5	2,558	20.3	12.1	12.1	2.0	8.2	9.5	3	2.5	17.2	90	68	70
1055/2	..	..	..	..	..	..	..	10	198	4.53	17.98	19.9	88.4	4.8	1,759	20.4	127.2	2.6	2,595	19.8	12.9	11.4	1.0	7.9	8.1	3	1.2	17.3	90	68	69
62	1923-24	19-9-25	30	..	..	..	..	3	142	6.90	21.86	30.2	51.8	5.2	1,564	..	..	..	..	..	6.3	11.2	5.0	3.4	19.7	3	0.9	..	86	80	56
72	1924-25	30-10-25	..	..	..	..	..	10	142	6.74	21.86	28.7	55.4	5.3	1,590	..	..	..	..	..	8.6	9.2	0.2	4.0	10.7	4	1.5	..	8	79	6
128	1925-26	18-5-26	..	..	..	..	..	5	140	6.78	21.86	29.5	54.5	5.2	1,608	..	..	..	..	..	7.0	12.1	5.2	5.0	15.0	4	4.0	..	90	64	6
245	1926-27	8-6-27	8	157	6.45	21.86	28.6	56.2	4.5	1,607	30.4	7.5	13.3	4.7	5.7	9.5	1	2.1	21.1	91	64	78
373	1927-28	19-4-28	1	155	6.46	21.86	30.0	50.7	7.7	1,521	30.4	7.3	14.8	5.2	5.7	8.5	4	3.2	21.2	88	63	68
497	1928-29	12-4-29	..	..	..	..	..	13	156	6.48	21.86	30.0	53.3	4.2	1,599	29.9	72.3	3.6	2,162	30.5	7.6	13.6	7.0	6.5	10.7	4	2.2	21.3	88	63	69
733	1929-30	15-5-30	..	..	..	..	..	20	161	7.07	21.86	29.9	48.1	7.1	1,438	29.7	80.4	3.2	2,388	30.6	7.0	11.9	5.5	5.5	12.9	4	2.1	21.1	90	58	63
1055/1	1930-31	21-5-31	..	..	..	..	..	13	162	6.72	21.86	29.7	48.2	4.5	1,431	30.4	83.0	3.3	2,523	30.0	7.3	13.7	6.0	7.0	9.3	4	1.7	21.0	91	68	69
1055/2	..	..	..	..	..	..	..	43	162	6.72	21.86	29.8	48.0	6.4	1,430	30.4	84.6	2.6	2,572	30.1	7.5	13.3	6.5	6.9	8.4	4	1.2	21.2	91	68	70
373	1927-28	19-4-28	34	7	146	7.31	23.26	33.3	43.6	6.7	1,452	33.1	6.6	13.9	6.5	5.4	11.3	5	3.4	22.6	86	62	69
497	1928-29	13-4-29	..	..	..	..	..	22	145	7.38	23.26	33.9	42.8	5.7	1,451	34.0	58.3	4.0	1,982	34.4	6.2	13.5	7.7	6.2	11.6	5	2.4	22.6	86	62	68
733	1929-30	16-5-30	..	..	..	..	..	31	145	8.01	23.26	33.3	40.1	5.5	1,335	32.9	73.8	2.9	2,428	33.8	6.0	13.9	6.5	5.4	14.1	5	1.9	22.3	90	63	63
1055/1	1930-31	22-5-31	..	..	..	..	..	37	146	7.24	23.26	33.4	40.0	9.7	1,336	35.1	72.8	2.9	2,555	34.6	5.9	17.2	11.5	6.7	10.1	5	2.2	22.2	91	68	68
1055/2	..	..	..	..	..	..	..	40	146	7.07	23.26	32.7	42.8	4.8	1,400	34.1	77.0	3.5	2,626	32.5	6.9	12.4	5.5	6.6	10.4	5	1.5	22.7	91	68	67
62	1923-24	21-9-25	40	..	..	..	..	2	115	8.97	26.97	40.5	31.1	6.1	1,260	..	..	..	..	..	4.7	13.8	8.2	3.3	22.7	6	1.0	..	87	82	52
72	1924-25	31-10-25	..	..	..	..	..	16	115	8.74	26.97	39.7	32.3	6.0	1,282	..	..	..	..	..	6.6	8.2	0.4	3.8	11.2	6	0.7	..	82	78	57
128	1925-26	19-5-26	..	..	..	..	..	6	114	9.23	26.97	39.5	34.2	6.3	1,351	..	..	..	..	..	5.1	12.2	5.2	4.9	12.4	6	4.2	..	90	64	60
245	1926-27	9-6-27	11	132	8.71	26.97	38.5	35.1	5.0	1,351	39.2	5.6	15.6	5.7	5.2	13.4	1	1.6	25.9	91	65	77

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

2.—JAYAWANT (KUMPTA).

Seasons ..	{	1926-27 (Sample No. 240).
		1927-28 (Sample No. 394).
		1928-29 (Sample No. 593).
		1929-30 (Sample No. 734).
		1930-31 (Sample No. 1056).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species*.—*Gossypium herbaceum*.
- (ii) *History*.—A pure strain obtained from a cross between two pure line selections of Kumpta, viz., Dharwar No. 1 and Dharwar No. 2. It possesses the good characters of both parents among which the resistance to wilt is one.
- (iii) *District of Growth*.—The districts of Dharwar, Belgaum, Bijapur, and the several Indian States. The cotton used in these tests is from the third generation crop grown near Hubli from seed multiplied in previous generations on the Government Farm, Dharwar.
- (iv) *Growing Period*.—Sown from the second week of August to the end of September, and picked from the second week of February up to the middle of April.
- (v) *Soil*.—Deep and medium black soil.
- (vi) *Rainfall*.—From 20 to 30 inches annually.
- (vii) *Temperature*.—Average minimum about 60° F.
- (viii) *Plant Particulars* :—
- Bolls per plant : 11 (spacing : 22"×12").
 - Seeds for boll : 17.
 - Weight of seed : 56 milligrammes.
 - Weight of lint per seed : 22 milligrammes.
 - Ginning Percentage : 29.
- (ix) *Yield of seed-cotton*.—Normally about 300 lbs. per acre. In 1930-31 the season was very unfavourable and the yield was only 140 lbs. per acre on an average.
- (x) *Area under cultivation*.— 1,000 acres in 1929-30.
18,000 „ „ 1930-31.

The above figures relate to the area under seed of known origin.

II. GRADER'S REPORT.

	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	Kumpta.	Broach.	Kumpta.	Kumpta.	Broach.
Class	Superfine.	Superfine.	Superfine.	Fully good to fine.	Fully good.
Colour	Creamy.	White.	Slight cream.	Creamy to reddish.	Reddish.
Staple Length ..	7/8 inch.	7/8-1 inch.	1 1/8 inch.	1 1/16 inch full.	One inch.
Staple Strength ..	Good.	Fair.	Good.	Fair.	Good.
Regularity	Fair.	Irregular.	Fair.	Fair.	Fair.
Value above or below contract rate ..	Ra. 10 on.	Ra. 30 on.	Ra. 60 on.	Ra. 10 on.	Ra. 55 on.
Basis .. .. .	..	Ra. 398.	Ra. 340.	Ra. 300.	Ra. 175.
Date of Valuation ..	20-4-27.	21-6-28.	26-9-29.	24-5-30.	30-5-31.
Remarks .. .. .	..	..	Soft.	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	PERCENTAGE.				
	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	..	0.4	..	0.2	0.1
3	1.3	1.3	0.7	1.4	1.9
4	2.6	2.4	2.5	3.0	3.7
5	6.6	6.0	4.7	6.8	9.0
6	17.3	17.1	10.4	14.1	18.4
7	33.2	31.4	19.6	25.8	30.0
8	27.0	29.1	28.5	30.9	23.6
9	10.2	9.8	22.9	13.1	9.9
10	1.8	2.5	9.4	3.6	2.8
11	..	..	1.3	1.1	0.6
2. Fibre-Length (inch) :—					
(a) By Balls Sorter	0.89	0.89	0.97	0.91	0.88
(b) By Baer Sorter	0.87	0.87	0.95	0.91	0.90
3. Fibre-Weight per inch (millionth of an ounce)					
	..	0.193	0.207	0.190	0.196
4. Fibre-Strength (oz.) :—					
(a) By Balls Tester .. .. .	..	..	..	0.189	0.178
(b) By O'Neill Tester .. .. .	..	..	..	0.196	0.181
5. Fibre-Strength per unit fibre-weight per inch					
	..	..	..	1.01	0.92
6. Fibre-Rigidity (millionth of an ounce, square inch)					
	..	..	..	0.238	0.180
7. Fibre-Width (thousandth of an inch)					
	..	..	..	0.72	0.65
8. Convolutions per inch					
	..	..	..	78	72

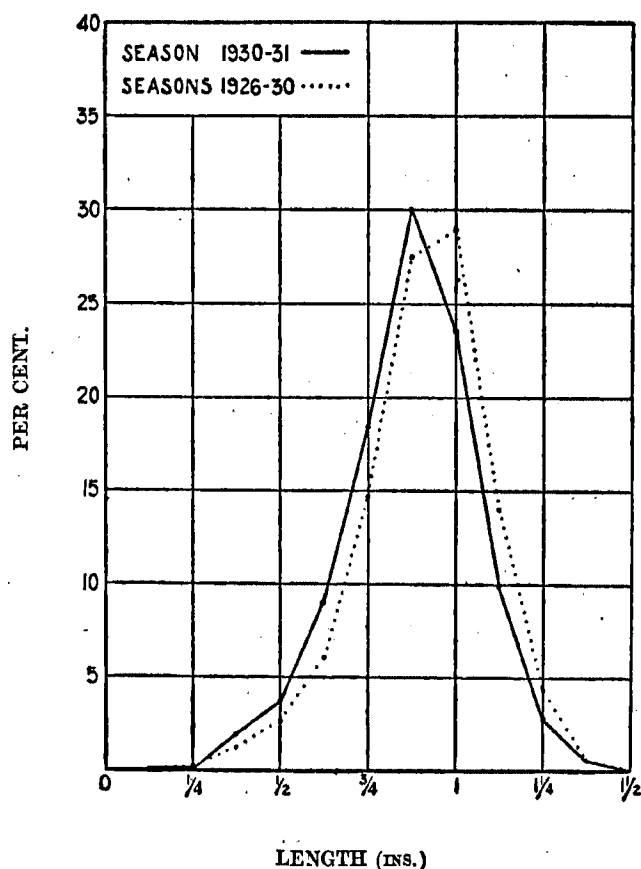


FIG. 2. Sorter Diagrams for Jayawant (Kumpta).

2.—JAYAWANT (KUMPTA).

Seasons ..	{	1926-27 (Sample No. 240).
		1927-28 (Sample No. 394).
		1928-29 (Sample No. 593).
		1929-30 (Sample No. 734).
		1930-31 (Sample No. 1056).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species.*—*Gossypium herbaceum*.
- (ii) *History.*—A pure strain obtained from a cross between two pure line selections of Kumpta, viz., Dharwar No. 1 and Dharwar No. 2. It possesses the good characters of both parents among which the resistance to wilt is one.
- (iii) *District of Growth.*—The districts of Dharwar, Belgaum, Bijapur, and the several Indian States. The cotton used in these tests is from the third generation crop grown near Hubli from seed multiplied in previous generations on the Government Farm, Dharwar.
- (iv) *Growing Period.*—Sown from the second week of August to the end of September, and picked from the second week of February up to the middle of April.
- (v) *Soil.*—Deep and medium black soil.
- (vi) *Rainfall.*—From 20 to 30 inches annually.
- (vii) *Temperature.*—Average minimum about 60° F.
- (viii) *Plant Particulars* :—
- (a) Bolls per plant : 11 (spacing : 22" × 12").
- (b) Seeds for boll : 17.
- (c) Weight of seed : 56 milligrammes.
- (d) Weight of lint per seed : 22 milligrammes.
- (e) Ginning Percentage : 29.
- (ix) *Yield of seed-cotton.*—Normally about 300 lbs. per acre. In 1930-31 the season was very unfavourable and the yield was only 140 lbs. per acre on an average.
- (x) *Area under cultivation.*— 1,000 acres in 1929-30.
18,000 „ „ 1930-31.

The above figures relate to the area under seed of known origin.

II. GRADER'S REPORT.

	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	Kumpta.	Broach.	Kumpta.	Kumpta.	Broach.
Class	Superfine.	Superfine.	Superfine.	Fully good to fine.	Fully good.
Colour	Creamy.	White.	Slight cream.	Creamy to reddish.	Reddish.
Staple Length ..	7/8 inch.	7/8-1 inch.	1 1/8 inch.	1 1/16 inch full.	One inch.
Staple Strength ..	Good.	Fair.	Good.	Fair.	Good.
Regularity	Fair.	Irregular.	Fair.	Fair.	Fair.
Value above or below contract rate ..	Ra. 10 on.	Ra. 30 on.	Ra. 60 on.	Ra. 10 on.	Ra. 55 on.
Basis .. .. .	..	Ra. 398.	Ra. 340.	Ra. 300.	Ra. 175.
Date of Valuation ..	20-4-27.	21-6-28.	26-9-29.	24-5-30.	30-5-31.
Remarks .. .. .	..	..	Soft.	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	PERCENTAGE.				
	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	..	0.4	..	0.2	0.1
3	1.3	1.3	0.7	1.4	1.9
4	2.6	2.4	2.5	3.0	3.7
5	6.6	6.0	4.7	6.8	9.0
6	17.3	17.1	10.4	14.1	18.4
7	33.2	31.4	19.6	25.8	30.0
8	27.0	29.1	28.5	30.9	23.6
9	10.2	9.8	22.9	13.1	9.9
10	1.8	2.5	9.4	3.6	2.8
11	..	..	1.3	1.1	0.6
2. Fibre-Length (inch):—					
(a) By Balls Sorter	0.89	0.89	0.97	0.91	0.88
(b) By Baer Sorter	0.87	0.87	0.95	0.91	0.90
3. Fibre-Weight per inch (millionth of an ounce)					
	..	0.193	0.207	0.190	0.196
4. Fibre-Strength (oz.):—					
(a) By Balls Tester .. .. .	..	..	..	0.189	0.178
(b) By O'Neill Tester .. .. .	..	..	..	0.196	0.181
5. Fibre-Strength per unit fibre-weight per inch					
	..	..	..	1.01	0.92
6. Fibre-Rigidity (millionth of an ounce, square inch)					
	..	..	..	0.238	0.180
7. Fibre-Width (thousandth of an inch)					
	..	..	..	0.72	0.65
8. Convolutions per inch					
	..	..	..	78	72

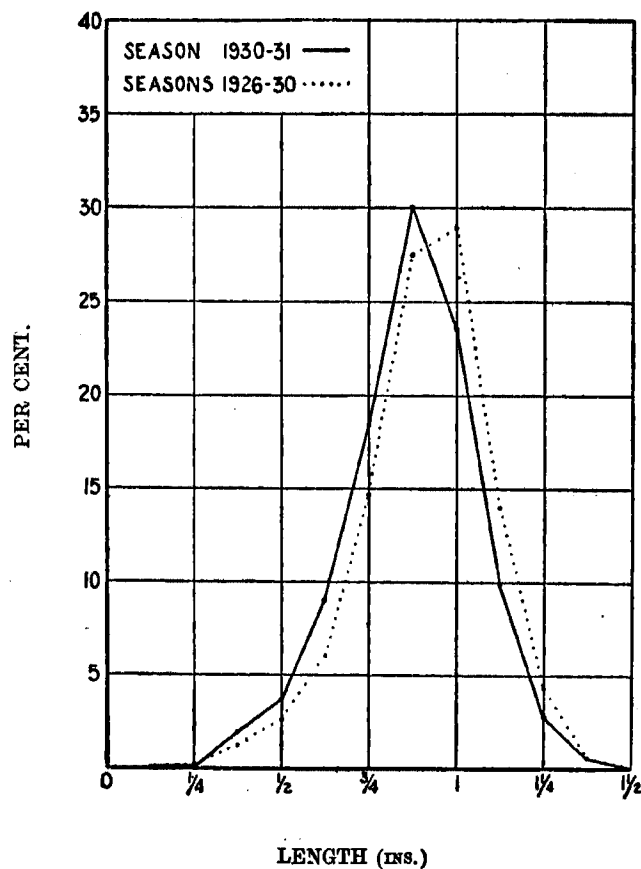


FIG. 2. Sorter Diagrams for Jayawant (Kumpta).

IV.—SPINNING TESTS.

1. *Treatment*.—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving in Ring Frame No. 1. The 1929-30 and 1930-31 cottons were passed twice through the Crighton; otherwise the treatment was the same as for the other seasons' cottons.
2. *Spinning Master's Report* :—
 - 1926-27 cotton : light cream ; very clean (free of leaf) ; a nice bodied feel ; well ginned ; its only fault is seed, chiefly cut seed.
 - 1927-28 cotton : creamy ; clean ; free of seed.
 - 1928-29 cotton : white to creamy-white ; bright ; very clean ; has a good soft feel ; well ginned ; staple is fine, regular, and strong.
 - 1929-30 cotton : dullish creamy ; somewhat leafy ; it has a good bodied feel, and except for rather excessive cut seed is well ginned. The staple is regular and strong. Card web is clear, and sliver clean ; 10 flat strips weighed 13.0 grams ; a good warp cotton.
 - 1930-31 cotton : creamy-white ; leafy ; has a good-bodied feel ; well ginned. The card sliver is clean, web very good and ten flat strips weigh 10.0 grams.
3. *Spinning Test Results* :—See Table 2, page 29.

V.—REMARKS.

(i) *Fibre*.—The fibre-length of this cotton was first measured in 1926-27, the fibre-weight per inch in the following season and the remaining fibre properties in 1929-30. The fibre-length is some 7 per cent. higher in 1928-29 than in the other four seasons. The fibre-rigidity is 24 per cent. less in 1930-31 than in the preceding season.

(ii) *Waste*.—The samples of this cotton were very clean upto 1928-29, but since then they have been rather wasty. The card-room loss is usually just under 8 per cent.

(iii) *Breakages*.—Yarn breakages in the ring frame were few in all cases in the first three seasons, 1926-29, but are rather numerous for the 1929-30 and 1930-31 samples.

(iv) *Yarns*.—This cotton usually gives even 20's and even to fairly even 30's, the 1929-30 yarns being slightly less even than usual. The yarns of this cotton are distinguished by freedom from neppiness. The yarn-strength results are not so good in 1929-30, and poorer still in 1930-31, as compared with the results of the previous seasons.

(v) *Conclusion*.—The following are the highest standard warp counts for which the cotton is suitable in the different seasons :—

1926-27	..	38's.
1927-28	..	38's.
1928-29	..	38's.
1929-30	..	32's.
1930-31	..	30's.

TABLE 2.—SPINNING TEST RESULTS FOR JAYAWANT (KUMPTA).
TRAVELLER COUNTS.

HANK (1930-31).
Draw-frame .. 0.18
Slubber .. 0.79
Inter .. 1.79
Rover .. 4.73

20^s .. 3/0
30^s .. 7/0
34^s .. 9/0

SPINDLE SPEED (1930-31).
20 A .. 9,400
20 B .. 9,750
30 .. 9,400
34 .. 9,450

Sample No.	Season.	Date of Spinning.	Counts Nominal.	Weight of Sample. (lbs.)	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE °F.	RELATIVE HUMIDITY (%).					
					Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIO.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
													Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%).	Extension Irregularity (%).					Evenness Class.	Neps per yard.	Turns per Inch Actual.
240	1926-27	20-4-27	20A	5	4.5	6.4	0.2	10.8	5	183	4.86	10.85	19.2	107.3	4.0	2,060	..	..	..	..	..	14.5	9.1	1.5	7.2	7.8	3	1.1	16.8	86	62	63
394	1927-28	13-6-28	"	5	2.5	7.6	0.4	10.2	7	195	4.30	16.85	20.0	97.0	6.0	1,940	20.3	13.1	10.5	2.0	6.2	7.1	3	1.5	16.1	87	76	70
593	1928-29	28-9-29	"	5	3.2	7.5	0.1	10.6	2	192	4.59	16.85	19.3	108.2	4.6	2,088	19.7	15.0	9.1	1.5	6.3	6.7	3	1.1	16.3	88	68	55
734	1929-30	16-5-30	"	10	9.3	7.9	0.5	17.0	22	196	4.39	16.85	19.9	90.2	5.9	1,795	20.0	122.5	3.7	2,450	20.3	13.4	9.8	1.2	6.2	7.1	3	2.2	16.4	90	61	63	
1056/1	1930-31	22-5-31	"	10	10.3	7.5	0.6	17.5	34	198	4.35	16.85	19.8	82.5	9.1	1,639	20.2	115.6	3.0	2,335	20.4	11.2	12.7	5.5	5.6	12.0	3	1.5	15.9	91	69	68	
1056/2	"	"	"	10	10.0	7.7	0.6	17.4	29	198	4.35	16.85	19.8	85.4	5.7	1,691	20.0	118.8	3.0	2,376	20.0	12.6	13.1	7.0	6.1	10.7	3	1.0	16.3	91	69	68	
734	1929-30	17-5-30	20B	10	..	..	..	..	32	195	4.44	17.98	19.9	99.3	4.4	1,986	20.2	126.3	3.2	2,551	20.7	14.1	10.1	1.5	6.4	7.1	3	1.6	17.3	91	61	63
1056/1	1930-31	22-5-31	"	10	..	..	..	..	17	195	4.35	17.98	19.3	94.3	4.6	1,820	19.7	126.4	2.8	2,490	19.4	13.7	12.5	5.0	6.2	13.8	3	1.7	17.1	92	67	71
1056/2	"	"	"	10	..	..	..	..	23	195	4.35	17.98	19.4	97.0	4.3	1,822	19.8	123.0	2.6	2,534	19.5	13.7	11.7	4.0	6.4	10.0	3	1.5	17.0	92	67	68
240	1926-27	20-4-27	30	5	..	..	..	..	7	141	7.15	21.86	29.1	61.0	4.5	1,775	..	..	..	..	..	9.3	11.4	2.5	6.4	8.2	4	1.0	21.6	87	68	63
394	1927-28	13-6-28	"	5	7	161	6.38	21.86	29.4	61.3	4.9	1,802	29.5	8.7	10.9	1.5	5.7	9.4	4	1.6	21.2	88	74	72
593	1928-29	30-9-29	"	5	5	159	7.02	21.86	28.8	63.0	4.2	1,814	29.9	9.3	12.0	5.0	6.0	8.0	4	1.5	21.2	88	68	64
734	1929-30	17-5-30	"	10	..	..	..	..	33	161	6.67	21.86	29.7	52.4	7.2	1,556	29.6	84.5	2.7	2,501	29.9	8.8	10.5	3.7	5.5	9.5	5	1.8	21.2	93	63	63
1056/1	1930-31	25-5-31	"	10	..	..	..	..	29	154	6.41	21.86	30.2	46.1	5.5	1,392	31.1	82.4	2.5	2,563	29.9	7.4	13.6	6.5	4.8	12.9	4	1.5	20.7	91	64	68
1056/2	"	"	"	10	..	..	..	..	25	154	6.34	21.86	29.9	50.9	6.2	1,522	30.3	84.4	3.3	2,557	30.3	7.5	15.6	10.0	5.1	9.8	4	2.0	21.4	91	64	70
593	1928-29	30-9-29	34	5	7	148	8.17	23.26	34.0	49.0	5.2	1,666	34.8	7.2	14.0	6.5	5.4	12.8	6	1.2	22.7	88	67	65
734	1929-30	19-5-30	"	10	..	..	..	..	51	149	7.67	23.26	34.2	40.4	8.1	1,382	34.3	72.1	3.2	2,473	35.2	6.9	12.3	4.7	5.0	11.2	6	2.0	22.6	92	62	64
1056/1	1930-31	25-5-31	"	10	..	..	..	..	40	146	7.07	23.26	33.8	40.9	7.7	1,382	34.7	74.4	2.9	2,582	38.9	6.3	15.0	12.0	4.4	15.5	5	1.5	22.3	91	63	63
1056/2	"	"	"	10	..	..	..	..	46	146	7.07	23.26	33.5	42.7	7.3	1,430	35.2	73.0	3.3	2,570	34.7	6.3	15.0	10.5	4.6	16.6	5	1.7	22.5	91	63	66
240	1926-27	22-4-27	40	5	..	..	..	..	4	116	9.14	26.97	41.5	33.6	7.8	1,394	..	..	..	..	..	5.8	13.7	7.5	5.7	9.8	6	0.9	25.6	88	65	62
394	1927-28	14-6-28	"	5	13	133	8.58	26.97	38.3	40.7	5.5	1,579	39.3	6.3	12.6	8.0	5.1	11.6	6	2.1	25.9	88	75	77

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

3.—GADAG 1 (DHARWAR-AMERICAN).

Seasons ..	{	1923-24 (Sample No. 70).
		1924-25 (Sample No. 71).
		1925-26 (Sample No. 131).
		1926-27 (Sample No. 244).
		1927-28 (Sample No. 368).
		1928-29 (Sample No. 513).
		1929-30 (Sample No. 719).
	}	1930-31 (Sample No. 1015).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A pure line selection from the hairy-leaved type of Dharwar-American (Dharwar-Upland). Upland Georgian and New Orleans types were originally introduced at the Dharwar Farm, but unsuccessfully, in 1830; fresh seed was imported at intervals; in 1912 the work on American cotton was transferred to Gadag, where Gadag 1 was eventually isolated from the Dharwar-American mixture.
- (iii) *District of growth* :—Dharwar district. The cotton used in these tests is from the fourth generation crop grown near Gadag from seed which has been multiplied for the first three generations on the Government Farm, Dharwar.
- (iv) *Growing period* :—Sown from the first week in September to the first week in November, and picked from the second week of February up to the middle of April.
- (v) *Soil* :—Medium black.
- (vi) *Rainfall* :—From 25 to 30 inches annually.
- (vii) *Temperature* :—Average minimum about 60° F.
- (viii) *Plant Particulars* :—
- (a) Bolls per plant : 5 (spacing : 22" × 12").
- (b) Seeds per boll : 17.
- (c) Weight of seed : 97 milligrammes.
- (d) Weight of lint per seed : 44 milligrammes.
- (e) Ginning percentage : 32.

(ix) *Yield of seed-cotton* :—For 1926-27, 215 lbs. per acre. In 1930-31 the yield was only 112 lbs. as the season was very unfavourable.

(x) *Area under cultivation* :—

1923-24	..	65,000 acres.	1927-28	..	58,300 acres.
1924-25	..	119,000 "	1928-29	..	76,900 "
1925-26	..	100,000 "	1929-30	..	72,300 "
1926-27	..	72,000 "	1930-31	..	78,600 "

The above figures give the annual area under seed of known origin. The total area under Gadag 1 in 1930-31 is estimated to be 118,000 acres, producing about 14,000 bales.

II. GRADER'S REPORT.

	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under ..	..	..	..	Kumpta. Fine.	F. G. Broach. Superfine.	Broach. Fine.	Kumpta. Fine.	Kumpta. Fine.
Class ..	Fine Western.	F.G.to F.West- ern.	Fine Western					
Colour ..	..	..	White.	Creamy.	White.	White.	White.	White.
Staple Length ..	13/16-15/16 in.	5/8-3/4 inch.	5/8-7/8 inch.	5/8-7/8 inch.	6/8-7/8 inch.	7/8 inch.	One inch.	1-1/8 inch.
Staple Strength ..	Good.	Poor.	Poor.	Fair	Fair.	Good.	Fair.	Poor.
Regularity ..	Not as regular as Dharwar 1.	Inferior to 1923- 24 sample, and not a fair sam- ple of Gadag cotton.	Irregular.	Poor.	Regular.	Good.	Fair.	Poor.
Value above or below contract rate ..	..	..	..	Ra. 15 off.	Ra. 35 to 40 on.	Ra. 50 on.	Par	Rs. 10 off.
Basis ..	..	..	..	Ra. 315	..	Ra. 326	Ra. 300.	Ra. 250.
Date of Valua- tion ..	..	..	..	20-4-27	2-4-28	14-5-29	24-5-30	15-4-31.
Remarks ..	..	..	..	..	..	..	Mostly Up- land cotton.	Not typical. Soft. More like Upland

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.3	0.1	1.2	..	0.4	0.2	0.1	..
3	1.9	2.3	2.4	2.7	1.7	1.8	1.6	3.0
4	3.5	4.6	4.8	4.8	3.7	3.8	3.8	4.8
5	7.0	12.1	9.7	11.0	7.2	9.4	8.1	8.1
6	14.5	25.7	21.2	29.8	17.0	24.4	19.1	18.9
7	29.9	35.3	34.1	37.2	37.7	37.6	38.8	31.1
8	29.8	15.7	21.6	11.8	25.7	18.4	23.3	23.6
9	11.0	4.1	5.0	2.7	6.0	4.3	5.1	8.7
10	1.9	0.1	..	..	0.6	0.1	0.1	1.8
11	0.2	..	..	..	..	..	..	..

2. Fibre-Length (inch):—								
(a) By Balls Sorter ..	0.89	0.81	0.82	0.80	0.86	0.83	0.85	0.86
(b) By Baer Sorter ..	0.89	0.81	0.83	0.82	0.86	0.82	0.84	0.89
3. Fibre-Weight per inch (millionth of an ounce).	0.174	0.154	0.150	0.179	0.167	0.162	0.148	0.153
4. Fibre-Strength (oz.):—								
(a) By Balls Tester ..	0.135	0.135	0.109	0.145	0.142	0.135	0.134	0.132
(b) By O'Neill Tester ..	0.142	0.116	0.106	0.137	0.155	0.147	0.147	0.144
5. Fibre-Strength per unit fibre-weight per inch ..	0.80	0.82	0.71	0.79	0.89	0.87	0.95	0.90
6. Fibre-Rigidity (millionth of an ounce, square-inch)	0.203	0.137	0.149	0.151	0.152	0.138	0.157	0.152
7. Ribbon-Width (thousandth of an inch)	0.70	0.67	0.71	0.63	0.62	0.59	0.64	0.66
8. Convolutions per inch ..	130	132	134	110	115	122	140	120

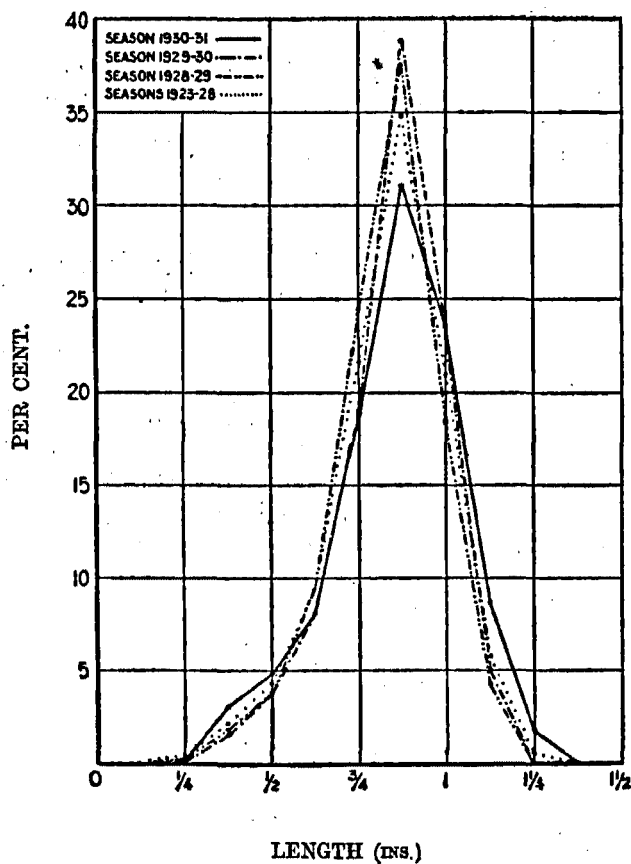


FIG. 3. Sorter Diagrams for Gadag 1—(Dharwar-American).

IV. SPINNING TESTS.

1. *Treatment*:—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1926-27 cotton was passed direct through the Crighton (once only); its subsequent treatment was the same as for the other seasons' cottons.

2. *Spinning Master's Report*:—

1923-24 cotton: a trifle seedy.

1924-25 cotton: creamy; it contains too much leaf and husk.

1925-26 cotton: white, leafy, and neppy.

1926-27 cotton: creamy, and very clean; it contains too many full seeds—ginned and unginned (0.6 per cent.)—but otherwise is a well-ginned sample and has a nice bodied feel.

1927-28 cotton: creamy white; fairly clean; it has a nice, soft and bodied feel; well ginned.

1928-29 cotton: creamy white; fairly clean; has a good feel; well ginned, but contains a fair number of small undeveloped seeds. Staple is fairly regular and strong.

1929-30 cotton: creamy-white; leafy; bright; it has a good bodied feel and except for occasional cut seed is well-ginned; the sample contains one per cent. ginned and unginned seeds; the staple is fairly regular in length but somewhat weak.

1930-31 cotton: white; bright; a trifle leafy; has a good feel; well-ginned. The card web is first class, sliver clean and ten flat strips weigh 12.5 grams.

3. *Spinning Test Results*:—See Table 3, page 33.

Card Production for Sample 70:—11.4 lb. per hour.

Ring Frame Production for 40's, Sample 70:—2.43 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The fibre-properties of this cotton show considerable seasonal variation. The fibre-length is high in 1923-24 and again in 1930-31. The fibre-weight per inch is low in 1924-25 and 1925-26. Both the fibre-strength and the fibre-strength per unit weight per inch are very low in 1925-26 but are comparatively high since 1926-27. The fibre-rigidity is high in 1923-24 and low in 1924-25 and 1928-29. In 1926-27 and 1927-28 the ribbon-width is low and the convolutions less numerous as compared with the other seasons.

(ii) *Waste*.—The blow-room loss is low in 1923-24 and 1927-28 and rather high in 1929-30. The card-room loss is very nearly the same in all seasons.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few, the exceptions being 1928-29 (20's and 30's), and 1930-31 (30's and 40's).

(iv) *Yarns*.—As regards evenness, neppiness, and strength the yarns of this cotton have given very different results in the different seasons. Thus in 1926-27 the 20's yarns are very even, in 1927-28 they are very even to even while in the following season they are even. The yarns of 1923-24 and 1926-27 are practically free of nep, those of 1925-26 decidedly neppy, while in the remaining seasons they are moderately neppy. As will be seen from the following highest standard warp counts for which this cotton was found suitable in the different seasons, the yarn-strength results show considerable seasonal variation:—

1923-24	..	36's.
1924-25	..	20's.
1925-26	..	30's.
1926-27	..	33's.
1927-28	..	33's.
1928-29	..	26's.
1929-30	..	32's.
1930-31	..	35's.

TABLE NO. 3—SPLICED TWIST RESULTS FOR CADAC I (DILATED) MILLING

Draw-frame .. 0.10
 Slubber .. 0.80
 Inter .. 1.76
 Rover .. 4.48

20° .. 3/0
 30° .. 7/0
 40° .. 12/0

9,700 r.p.m.
 9,700 r.p.m.
 9,800 r.p.m.

Sample No.	Season	Date of Spinning	Counts Nominal	WASTE PERCENTAGES				RING FRAME PARTICULARS*				YARN TEST RESULTS						Singles Thread	Evenness Class	Knots per yard	Turns per inch Actual	Spinning Room	Finishing Room							
				Blow Room Loss	Card Room Loss	Spinning Loss	Total Loss	Tarn Breakages per 100	Front Roller Speed	Draft	Turns per inch	Counts Actual	Strength (lbs.)	Strength (%)	Count-Strength	Counts Actual	Work of machine (inch-lbs.)							Work Irregularity (%)	Count Work Product	Combs	Strength (mm)	Strength (%)	Work Irregularity (%)	Work Irregularity (%)
				Flow Room Loss	Card Room Loss	Spinning Loss	Total Loss	Yarn Breakages per 100	Front Roller Speed	Draft	Turns per inch	Counts Actual	Strength (lbs.)	Strength (%)	Count-Strength	Counts Actual	Work of machine (inch-lbs.)							Work Irregularity (%)	Count Work Product	Combs	Strength (mm)	Strength (%)	Work Irregularity (%)	Work Irregularity (%)
70	1023-24	28-10-26	204	4.6	7.1	0.8	12.1	13	183	4.60	16.85	10.7	89.0	5.7	1,694	20.1	10.3	9.6	2.8	8.8	14.6	2	1.1	..	77	55				
71	1024-25	29-10-26	"	8.4	8.9	1.3	17.6	85	183	4.85	16.85	19.6	59.5	6.5	1,188	20.2	..	9.4	0.8	6.6	9.5	8	2.6	..	76	64				
181	1025-26	22-5-26	"	8.8	8.5	0.5	16.9	10	180	4.78	16.85	19.6	76.7	6.8	1,484	20.2	..	10.6	4.2	6.0	11.6	8	5.2	..	67	66				
244	1026-27	31-5-27	"	6.6	7.5	0.8	14.8	8	192	4.44	16.85	19.4	89.4	4.0	1,928	20.2	..	10.7	8.2	7.8	7.8	1	2.9	16.0	68	61				
303	1027-28	31-8-28	"	5.5	7.5	0.1	13.1	2	190	4.67	16.85	19.7	94.1	5.2	1,864	20.2	..	20.6	1.7	7.8	8.1	2	2.9	16.5	65	67				
513	1028-29	18-5-29	"	8.7	8.6	0.6	17.1	64	191	4.80	16.85	20.2	71.0	6.8	1,434	20.1	..	20.9	8.7	6.8	7.5	8	2.1	16.2	68	69				
719	1029-30	26-4-30	"	10.8	8.6	0.3	18.8	10	196	4.76	16.85	19.8	58.2	4.5	1,707	20.2	..	20.9	10.8	7.7	8.0	8	8.0	16.2	65	64				
719	1029-30	26-4-30	203	..	..	..	..	12	195	4.58	17.98	20.0	90.8	8.9	1,812	20.0	..	132.7	2.7	11.6	8.5	8	2.7	17.2	61	61
1015/1	1030-31	2-4-31	"	8.1	7.7	0.6	15.7	18	197	4.65	17.98	20.0	94.8	4.8	1,886	20.1	..	132.6	8.8	10.1	7.9	8	2.7	17.8	70	70				
1015/2	"	"	"	6.9	8.1	0.6	14.9	20	197	4.65	17.98	20.1	95.7	4.1	1,924	20.7	..	132.0	5.8	9.9	7.2	2	2.0	17.8	68	68				
513	1028-29	14-5-29	26	..	..	..	..	85	172	5.45	20.28	25.5	59.1	6.8	1,480	25.1	..	91.2	8.0	6.0	8.5	4	1.8	19.8	64	71
719	1029-30	30-4-30	"	..	..	..	..	20	177	6.84	20.28	26.0	89.2	5.1	1,693	26.6	..	96.8	2.2	7.2	8.0	4	2.7	19.4	64	64
70	1023-24	22-10-25	80	..	..	..	..	8	143	7.03	21.86	20.7	51.9	5.4	1,541	..	..	..	10.4	2.8	2.7	8	0.0	..	79	67
71	1024-25	20-10-25	"	..	..	..	..	17	187	6.86	21.86	29.2	80.0	7.7	1,188	..	..	..	6.6	0.4	4.2	6	2.0	..	76	66
181	1025-26	24-5-26	"	..	..	..	..	11	140	7.14	21.86	20.4	48.9	6.4	1,426	..	..	..	7.7	5.0	5.0	8	5.7	..	63	63
244	1026-27	1-6-27	"	..	..	..	..	7	157	6.47	21.86	28.6	80.5	6.7	1,780	..	..	..	8.7	6.8	7.1	1	1.4	21.0	64	69
303	1027-28	2-4-28	"	..	..	..	..	6	159	6.64	21.86	80.1	57.5	5.1	1,781	..	..	..	8.0	5.2	6.4	8	8.0	21.6	60	70
513	1028-29	14-5-29	"	..	..	..	..	85	157	6.40	21.86	20.4	46.7	6.8	1,843	28.8	..	75.6	4.1	6.0	5.7	5	1.6	20.9	61	64
719	1029-30	26-4-30	"	..	..	..	..	23	162	7.25	21.86	80.0	50.4	6.4	1,512	29.9	..	64.4	2.2	7.8	12.1	6	9.1	20.8	61	63
1015/1	1030-31	2-4-31	"	..	..	..	..	27	164	6.90	21.86	29.5	55.1	8.8	1,625	20.7	..	64.5	2.1	7.7	12.6	4	2.5	20.9	67	67
1015/2	"	"	"	..	..	..	..	81	184	8.90	21.86	80.2	54.9	6.0	1,668	80.2	..	83.2	2.8	8.5	11.7	4	2.2	21.3	66	66
70	1023-24	22-10-25	40	..	..	..	..	4	114	9.46	26.07	40.0	38.8	5.6	1,332	..	..	..	4.9	4.2	2.6	5	1.0	..	79	69
71	1024-25	26-10-25	"	..	..	..	..	25	108	8.44	26.07	88.8	24.1	7.5	1,000	..	..	..	4.7	8.8	0	8	2.7	..	69	62
181	1025-26	25-5-26	"	..	..	..	..	18	115	9.67	26.07	88.1	35.8	6.9	1,345	..	..	..	5.9	12.4	4.8	9	6.0	..	61	65
244	1026-27	2-6-27	"	..	..	..	..	13	129	8.77	26.07	88.7	38.9	6.0	1,505	..	..	..	8.4	8.2	10.1	8	1.4	25.7	61	64
303	1027-28	2-4-28	"	..	..	..	..	1	132	8.77	26.07	89.4	38.8	5.8	1,529	..	..	..	4.5	6.1	5.9	5	4.2	26.0	63	68
1015/1	1030-31	7-4-31	"	..	..	..	..	40	134	9.14	26.07	80.9	35.6	4.3	1,420	39.1	..	66.4	8.5	5.7	13.5	5	3.5	26.2	66	67
1015/2	"	"	"	..	..	..	..	81	134	9.14	26.07	40.0	35.1	4.5	1,491	40.9	..	68.0	3.0	6.0	13.4	5	1.7	26.6	68	68

* Diameter of ring frame roller— $\frac{7}{8}$ inch. Diameter of rings— $\frac{1}{8}$ inch.

4.—SURAT 1027 A.L.F.

Seasons ..	{	1923-24 (Sample No. 104).
		1924-25 (Sample No. 83).
		1925-26 (Sample No. 116).
		1926-27 (Sample No. 246).
		1927-28 (Sample No. 363).
		1928-29 (Sample No. 487).
		1929-30 (Sample No. 716).
	}	1930-31 (Sample No. 1018).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species*:—*Gossypium herbaceum*.
- (ii) *History*:—Derived from a hybrid (1027) originally made at Kirkee Farm in 1901 between *Kumpta* and *Goghari* cottons: two specially good plants (1027A) were isolated in 1904, and continued selection gave in 1907 two new types—1027 A, long and coarse, and 1027 A, long and fine, the latter being styled 1027 A.L.F. in 1910-11. The selection work was continued thereafter, and the present 1027 A.L.F. is a pure line from an individual selection made in 1917-18. (References: Annual Reports, Surat Agricultural Station, 1907-15; Memoir of the Department of Agriculture in India, Botanical Series, Vol. XII, No. 5, 1924).
- (iii) *District of growth*:—Broach tract, i.e., Southern Gujarat; Broach and Surat districts and adjacent parts of Baroda State (Navsari district). The particular samples used in these tests have been grown on the Government Farm, Surat.
- (iv) *Growing period*:—Sown in the third week in June, and picked from mid-March onwards.
- (v) *Soil*:—Black cotton soil, supposed to be the result of an alluvium brought down by the Tapti and the Nerbudda rivers.
- (vi) *Rainfall*:—30 to 40 inches annually.
- (vii) *Temperature*:—Means, 85°F. (April to August); 81°F. (September to November).
- (viii) *Plant particulars*:—
- Bolls per plant: 38 (spacing: 36" × 36").
 - Seeds per boll: 22.
 - Weight of seed: 63 milligrammes.
 - Weight of lint per seed: 36 milligrammes.
 - Ginning percentage: 35.
- (ix) *Yield of seed-cotton*:—586 lbs. per acre on Surat Farm.
- (x) *Area under cultivation*:—

1923-24	..	250,000 acres.
1925-26	..	119,000 "
1926-27	..	465,000 "
1927-28	..	250,000 "
1928-29	..	481,000 "
1929-30	..	450,000 "

The above figures relate to the area under seed of known origin; the total area is considerably greater.

II. GRADER'S REPORT.

—	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under ..	..	..	..	Broach. Superfine.	Broach. Extra Super-fine.	Broach. Extra Super-fine.	Broach. Superfine.	Broach. Superfine.
Class ..	Superfine Surat.	Fine.	Fine.	White.	White.	White.	White.	White.
Colour ..	..	..	White.	White.	White.	White.	White.	White.
Staple Length..	15/16-17/16 inch.	15/16-17/16 inch.	Full inch.	15/16 to 1 inch.	1 1/16 inch.	Full one inch.	1 inch.	1 1/16 inch.
Staple Strength	Good.	Good.	Strong.	Good.	Good.	Good.	Good.	Fair.
Regularity ..	Regular.	Regular.	Regular.	Fair	Good.	Good.	Good.	Fair.
Value above or below contract rate ..	..	..	..	Ra. 60 on.	Ra. 105 on.	Ra. 80 on.	Ra. 100 on.	Ra. 75 on.
Basis ..	..	..	..	..	..	Ra. 370	Ra. 250.	Ra. 190.
Date of Valuation ..	..	..	..	17-5-27.	23-3-28.	18-3-29.	16-4-30.	15-4-31.

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.1	0.2	0.3	..	0.8	..	0.1	..
3	0.5	1.1	1.3	1.6	1.6	1.2	1.0	1.8
4	1.6	2.1	2.4	2.6	3.1	2.4	1.9	3.0
5	3.8	4.7	5.0	4.9	6.1	5.4	4.0	6.0
6	9.2	9.1	10.5	9.3	10.2	10.2	9.2	11.3
7	18.3	22.1	28.0	17.9	18.2	19.1	20.3	23.5
8	26.9	36.1	34.2	28.2	28.0	29.8	32.3	32.2
9	22.5	18.8	15.6	24.3	23.3	22.1	22.3	16.2
10	12.7	5.4	2.7	9.4	7.7	7.9	7.1	4.7
11	4.4	0.4	..	1.8	1.0	1.9	1.8	1.3
2. Fibre-Length (inch):—								
(a) By Balls Sorter ..	1.00	0.95	0.92	0.97	0.95	0.96	0.97	0.93
(b) By Baer Sorter ..	1.01	0.95	0.93	0.98	0.94	0.96	0.97	0.95
3. Fibre-Weight per inch (millionth of an ounce)								
	..	0.204	0.237	0.200	0.207	0.204	0.180	0.201
4. Fibre-Strength (oz.):—								
(a) By Balls Tester ..	..	..	..	0.171	0.159	0.181	0.165	0.183
(b) By O'Neill Tester ..	..	..	..	0.172	0.175	0.149	0.177	0.190
5. Fibre-Strength per unit fibre-weight per inch								
	..	..	..	0.85	0.81	0.81	0.95	0.93
6. Fibre-Rigidity (millionth of an ounce, square inch)								
	..	..	..	0.162	0.132	0.125	0.157	0.192
7. Ribbon-Width (thousandth of an inch)								
	0.90	0.72	0.72	0.73	0.74	0.71	0.74	0.67
8. Convolutions per inch								
	140	128	127	96	73	63	45	63

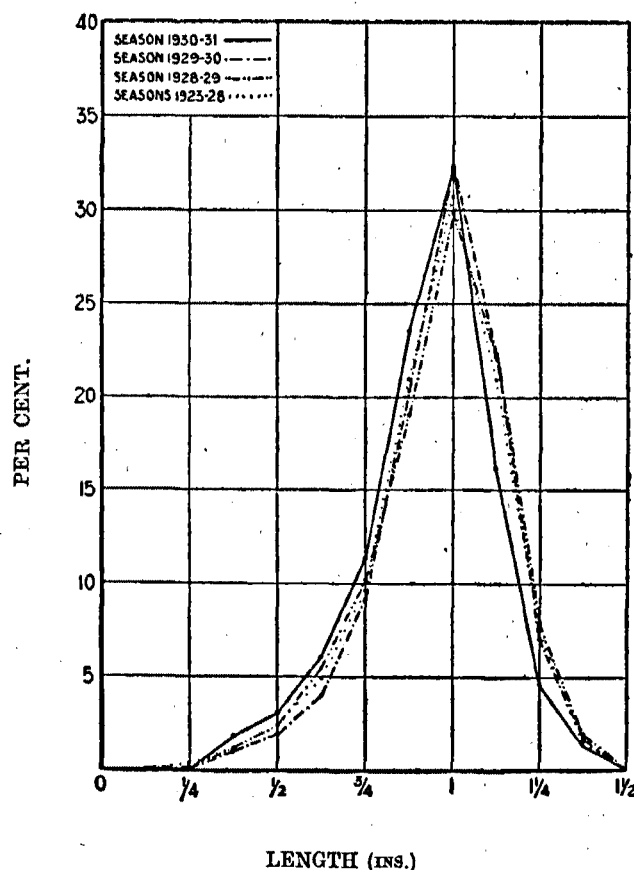


Fig. 4. Sorter Diagrams for Surat 1027 A.L.F.

IV. SPINNING TESTS.

1. *Treatment*:—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1927-28 cotton was passed direct through the Crighton (once only); its subsequent treatment was the same as for the cottons of the other seasons.
2. *Spinning Master's Report*:—
 - 1923-24 cotton: creamy, a little leafy, containing a few seeds; and very soft.
 - 1924-25 cotton: creamy, clean, and soft.
 - 1925-26 cotton: whitish and leafy.
 - 1926-27 cotton: creamy white and bright; a silky and bodied feel; a little leafy; except for a little cut seed it is very well ginned, and is a very fine sample.
 - 1927-28 cotton: white, bright, and very clean; a strong and silky staple but much too soft, resulting in a deal of licking in the finisher lap; well ginned; a fine showy cotton.
 - 1928-29 cotton: white; clean and very bright; has a soft and silky feel and plenty of cling, and, except for cut seed (0.27 per cent.) is well-ginned; staple is even and very strong; a very desirable cotton.
 - 1929-30 cotton: white; very bright; has a very soft feel; very clean and well-ginned; the staple is strong and regular in length; a very desirable and showy weft cotton. The card flat strips are unusually light in weight, ten full sized strips weighing 9.75 grams.
 - 1930-31 cotton: white; very bright; perfectly clean; has a good soft feel; very well-ginned; the card web is first class, sliver clean and ten flat strips weigh 7.9 grams only; a very desirable cotton.
3. *Spinning Test Results*:—See Table 4, page 37.
 - Card Production for Sample 104:—11.8 lb. per hour.
 - Ring Frame Production for 30's B, Sample 104:—3.67 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The fibre-length and the fibre-weight per unit length are very nearly the same in all seasons except 1925-26 when the staple is slightly shorter and coarser than usual. The fibre-strength is high in 1930-31 and the fibre-strength per unit fibre-weight per inch low in 1927-28 and 1928-29. The fibre-rigidity and convolutions per inch both show considerable seasonal variation, the latter being in 1923-24 more than three times as numerous as in 1929-30. The ribbon-width is remarkably constant except in 1923-24 and 1930-31 when the highest and the lowest values respectively were obtained.

(ii) *Waste*.—This is a clean cotton, the blow-room loss being particularly low since 1927-28. The card-room loss, being nearly the same in all seasons, lay between 7 and 8 per cent.

(iii) *Breakages*.—Yarn breakages in the ring frame were generally few in most cases, though they were more numerous than usual in 30's and 34's counts of the 1930-31 cotton.

(iv) *Yarns*.—The yarns of this cotton are generally very even to even in 20's and even to fairly even in 30's counts, though in 1928-29, and again in 1930-31, the yarns are comparatively less even. The yarns of this cotton are usually slightly neppy. Except 1925-26 when the yarns were distinctly weaker, the yarn-strength results are nearly the same in the successive seasons.

(v) *Conclusion*.—The more important fibre properties and yarn characteristics of this cotton do not show much variation with the season. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:

1923-24	..	30's.	1927-28	..	30's.
1924-25	..	32's.	1928-29	..	32's.
1925-26	..	26's.	1929-30	..	34's.
1926-27	..	32's.	1930-31	..	29's.

THANS (1090-81)

Draw frame 0.81
Inter 1.76
Loyer 4.78

STAINLESS STEEL (Grade 17-7 PH)
0.400 P.P.M.
207A
0.650 P.P.M.
307
0.650 P.P.M.
307
0.700 P.P.M.

Tensile		Tensile Strength					Tensile Elongation					Impact					Chemical					Mechanical										
Temp.	Stress	Elong.	Yield	Tensile	Modulus	Reduction of Area	Temp.	Charpy	Kupf.	Temp.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Nb	Ti	N	O	H	As	Sn	Zn	Pb	Fe			
																														Impact	Temp.	C
100	1225	12.2	11.8	14.5	10.5	22.1	11.8	78.1	10.8	10.9	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	1325	12.2	11.8	14.5	10.5	22.1	11.8	78.1	10.8	10.9	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	1325	12.2	11.8	14.5	10.5	22.1	11.8	78.1	10.8	10.9	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	1325	12.2	11.8	14.5	10.5	22.1	11.8	78.1	10.8	10.9	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	1325	12.2	11.8	14.5	10.5	22.1	11.8	78.1	10.8	10.9	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.—WAGAD 8—(DHOLLERAS).

Seasons ..	}	1925-26 (Sample No. 160).
		1926-27 (Sample No. 271).
		1927-28 (Sample No. 372).
		1928-29 (Sample No. 494).
		1929-30 (Sample No. 698).
		1930-31 (Sample No. 1008).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—Wagad cotton is the best constituent of the commercial crop known as Dholleras, of which it forms about 75 per cent. The most characteristic feature of the Wagad variety is that the bolls do not open when ripe, and are consequently picked entire in one lot, the seed-cotton being extracted later when convenient. Wagad 8 was originally selected in 1917-18; it has been found to be pure since 1919-20, and has been grown on a field scale since 1921-22. (Reference—Memoir of the Department of Agriculture in India, Botanical Series, Vol. XIV, No. 2, of 1926.)
- (iii) *District of growth* :—North Gujarat-Viramgam Taluka of the Ahmedabad district, North and Western Kathiawar, and Cutch. The particular samples used in these tests have been grown on the Government Farm, Viramgam.
- (iv) *Growing period* :—Sown in the beginning of July, and picked in March.
- (v) *Soil* :—*Besar*—a saltish alluvium derived from the granitic and gneissic rocks of Rajputana and Central India.
- (vi) *Rainfall* :—Variable over the area, averaging from 13 to 30 inches annually, 19.9 inches in 1930-31.
- (vii) *Temperature* :—Lowest monthly mean 58°F. (January).
- (viii) *Plant particulars* :—
- Bolls per plant : 9 (spacing : 24" × 11").
 - Seeds per boll : 18.
 - Weight of seed : 71 milligrammes.
 - Weight of lint per seed : 47 milligrammes.
 - Ginning percentage : 40.
- (ix) *Yield of seed-cotton* :—665 lbs. per acre on Viramgam Farm, 1923-27.
556 lbs. per acre on Viramgam Farm, 1929-30.
513 lbs. per acre on Viramgam Farm, 1930-31.
- (x) *Area under cultivation* :—
- | | |
|------------|--|
| 1926-27 .. | 60 acres. |
| 1927-28 .. | 250 acres, almost completely ruined by floods. |
| 1928-29 .. | 20 acres. |
| 1929-30 .. | 105 acres. |
| 1930-31 .. | 1,500 acres. |

The quantity of seed distributed during 1927-28 was 3,800 lbs., covering about 250 acres.

II. GRADER'S REPORT.

	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	....	Dholleras.	F. G. Broach.	Dholleras.	Dholleras.	Broach.
Class	Fine to Superfine.	Fine.	Fine to Superfine.	Fine.	Fine.	Fine.
Colour	White.	White.	White.	White.	White.	White.
Staple Length ..	1/2-5/8 inch.	3/4 inch.	5/8-3/4 inch.	3/4 inch.	7/8 inch.	7/8 inch.
Staple Strength ..	Good.	Fair.	Weak.	Good.	Poor.	Fair.
Regularity	Regular.	Fair.	Irregular.	Good.	Fair.	Fair.
Value above or below contract rate ..	..	Rs. 5 on.	Rs. 8 on.	Rs. 5 on.	Pass.	Rs. 20 on.
Basis .. ..	..	Rs. 330.	Rs. 308.	Rs. 354.	Rs. 250.	Rs. 205.
Date of Valuation ..	..	..	17-4-28.	12-4-29.	16-4-30.	26-3-31.
Remarks .. ..	..	..	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.					
	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.8	0.4	1.4	1.5	..	0.4
3	2.5	2.1	3.2	2.5	2.3	2.5
4	5.6	5.1	6.4	5.4	5.3	6.1
5	12.4	14.4	14.9	12.3	19.3	17.7
6	30.1	29.3	28.5	26.6	35.7	37.0
7	34.9	31.0	30.7	32.4	27.4	25.4
8	11.1	14.6	12.5	15.4	8.1	8.5
9	2.6	3.1	1.9	3.6	1.9	2.4
10	..	..	0.5	0.3	..	..
2. Fibre-Length (inch):—						
(a) By Balls Sorter	0.79	0.80	0.77	0.80	0.76	0.77
(b) By Baer Sorter	0.79	0.81	0.77	0.81	0.75	0.79
3. Fibre-Weight per inch (millionth of an ounce)						
..	0.258	0.264	0.189	0.239	0.195	0.257
4. Fibre-Strength (oz.):—						
(a) By Balls Tester	0.143	0.181	0.139	0.137	0.136	0.167
(b) By O'Neill Tester	0.141	0.175	0.109	0.151	0.130	0.178
5. Fibre-Strength per unit fibre-weight per inch						
..	0.55	0.67	0.66	0.60	0.68	0.67
6. Fibre-Rigidity (millionth of an ounce, square inch)						
..	0.162	0.221	0.122	0.135	0.139	0.288
7. Ribbon-Width (thousandth of an inch)						
..	0.71	0.72	0.72	0.76	0.77	0.77
8. Convolutions per inch						
..	63	45	46	58	56	59

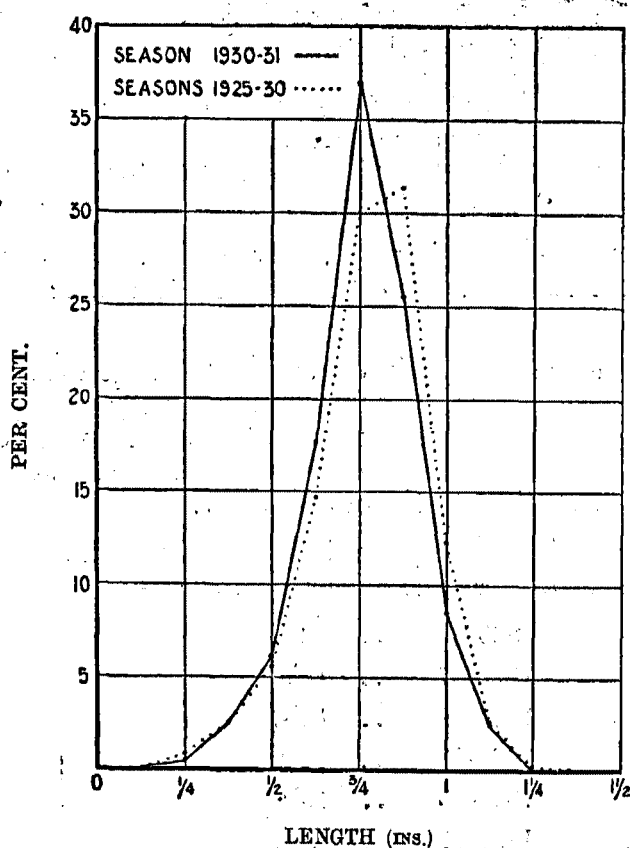


FIG. 5.—Sorter Diagrams for Wagad 8—(Dhollera s).

IV. SPINNING TESTS.

1. *Treatment*.—Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1927-28, 1928-29, 1929-30, and 1930-31 cottons were passed through the Lattice Feeder also, but the two former cottons were passed only once through the Crighton; their subsequent treatment was the same as for the previous seasons' cottons.
2. *Spinning Master's Report*:—
 - 1925-26 cotton: white, leafy, and seedy (0.5 per cent.), with too much cut seed and gin nep.
 - 1926-27 cotton: whitish; rather dull; leafy; contains too much whole seed but is otherwise well ginned; staple good.
 - 1927-28 cotton: creamy-white; leafy (very fine leaf); feels soft and weak; contains too many unginned seeds (0.5 per cent.).
 - 1928-29 cotton: white; fairly clean; well ginned.
 - 1929-30 cotton: white; has a good feel; fairly leafy and, except for a little cut seed, well-ginned; staple is fine and regular, and of fair strength. The greater blow-room loss in the second lot is due to better cleaning of the cotton as a result of cleaning out the air passages of the scutcher fan.
 - 1930-31 cotton: white; bright; shows an occasional stain; fairly leafy but well-ginned; the card web is clear and even, sliver clean and ten flat strips weigh 12.8 grams.
3. *Spinning Test Results*:—See Table 5, page 41.

V. REMARKS.

(i) *Fibre*.—The fibre-properties of this cotton show seasonal variation. The fibre-length and the fibre-weight per inch are both low in 1927-28 and 1929-30. The fibre-strength is some 25 per cent. higher than usual in 1926-27 and 1930-31. The fibre-strength per unit fibre-weight per inch is low in 1925-26. The fibre-rigidity is very variable, being 140 per cent. more in 1930-31 than in 1927-28. The convolutions are about 30 per cent. more numerous in 1925-26 than in the two succeeding seasons.

(ii) *Waste*.—Except in 1928-29, the samples of this cotton have been rather wasty, being particularly so in 1927-28 and 1930-31. The card-room loss was unusually high in 1925-26 which may be due to the sample of this season weighing 4 lbs. only.

(iii) *Breakages*.—Yarn breakages in the ring frame were fairly numerous in all counts in 1929-30, in 12's counts in 1925-26 and in 14's counts in 1930-31.

(iv) *Yarns*.—The yarns of this cotton usually range from very even to even in 10's, to even in 14'sB, the 1929-30 yarns being slightly less even than usual. They are usually free from neppiness, but the yarns of 1927-28 and 1929-30 were rather neppy. The yarn-strength results were better in the two seasons 1927-29 than in the other seasons.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1925-26	..	12's.
1926-27	..	14's.
1927-28	..	15's.
1928-29	..	15's.
1929-30	..	12's.
1930-31	..	12's.

TABLE 5.—SPINNING TEST RESULTS FOR WAGAD 8.
TRAVELLER COUNTS.

HANK (1930-31).
Draw-frame .. 0.17
Slubber .. 0.74
Inter .. 1.55
Rover .. 3.10

10 .. 5
12 .. 3
14 .. 1
16 .. 1/0

SPINDLE SPEED (1930-31).
10° .. 6,900 r. p. m.
14°A .. 8,100 r. p. m.
14°B .. 8,800 r. p. m.
14°C .. 9,500 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).						
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (oz.)	Strength Irregularity (%)	Weakness Percentage.		Extension (%)	Extension Irregularity (%)	Evenness Class.				Nepe per yard.	Turns per Inch Actual.
271	1926-27	15-7-27	10	7.4	8.4	0.4	15.5	25	100	4.94	12.83	9.9	137.7	5.4	1,383	..	..	..	..	10.3	17.3	13.8	6.5	8.4	6.0	2	1.1	12.3	86	78	71
372	1927-28	16-4-28	"	9.0	9.7	0.1	18.0	0	196	4.26	12.83	10.5	134.1	3.6	1,408	..	..	..	..	11.0	17.0	9.4	1.7	9.7	6.4	2	3.1	12.4	88	62	68
494	1928-29	8-4-29	"	5.4	7.6	0.2	12.8	0	200	4.24	12.83	10.5	138.8	3.9	1,457	10.5	253.8	2.7	2,665	10.5	18.5	9.9	2.7	9.5	7.1	2	1.3	12.2	89	60	73
698	1929-30	24-3-30	"	7.8	9.7	0.2	16.9	25	196	3.75	12.83	10.1	124.9	4.4	1,261	10.1	236.6	3.0	2,390	10.4	16.9	12.7	6.5	8.8	8.1	2	3.2	12.2	88	65	67
1008/1	1930-31	18-3-31	"	10.8	8.5	0.3	18.5	0	195	3.80	12.83	10.4	107.6	3.8	1,119	10.4	222.8	2.6	2,317	10.3	16.5	10.7	1.5	8.3	8.9	2	1.0	12.1	82	66	68
1008/2	"	"	"	10.0	8.2	0.6	17.9	10	195	3.87	12.83	10.1	120.5	6.4	1,217	10.1	233.6	2.8	2,359	10.3	17.4	12.9	5.0	8.8	8.2	2	0.7	12.0	82	66	67
160	1925-26	5-8-26	12	8.3	12.8	0.4	20.2	45	188	5.88	13.92	11.9	93.5	6.1	1,113	..	..	..	..	..	13.5	14.0	8.5	6.3	9.6	3	1.4	13.4	86	83	83
698	1929-30	24-3-30	"	..	..	..	..	20	200	4.48	13.92	12.3	92.6	6.2	1,139	12.1	188.6	2.7	2,282	12.7	13.4	10.9	4.0	8.1	8.6	3	3.0	13.4	88	69	65
271	1926-27	15-7-27	14A	..	..	..	..	3	166	6.89	15.08	14.0	88.4	6.0	1,238	..	..	..	..	14.4	11.8	12.9	5.5	7.9	7.3	4	1.2	14.9	87	76	72
372	1927-28	17-4-28	"	..	..	..	..	0	192	5.59	15.08	14.6	88.8	4.6	1,296	..	..	..	..	14.8	11.8	10.0	2.7	8.4	9.0	3	4.0	14.7	88	63	70
494	1928-29	8-4-29	"	..	..	..	..	10	194	5.74	15.08	14.3	92.4	4.8	1,321	14.2	156.4	3.3	2,221	14.8	12.5	9.6	1.5	8.2	7.2	3	1.2	14.5	89	65	69
698	1929-30	24-3-30	"	..	..	..	..	23	192	5.21	15.08	14.2	75.2	5.8	1,068	14.2	157.4	2.3	2,235	14.7	11.2	13.8	7.5	7.7	8.7	4	3.3	14.6	87	65	67
1008/1	1930-31	18-3-31	"	..	..	..	..	0	195	5.38	15.08	13.9	72.7	5.1	1,010	14.5	153.6	2.8	2,227	14.3	11.2	10.4	2.0	7.1	9.5	3	1.0	14.2	80	63	65
1008/2	"	"	"	..	..	..	..	33	195	4.49	15.08	13.8	76.2	6.7	1,052	14.2	154.4	2.3	2,192	13.7	12.0	9.7	1.0	8.7	6.8	4	0.7	14.3	80	63	70
160	1925-26	5-8-26	14B	..	..	..	..	13	174	6.85	15.97	13.7	84.7	7.5	1,160	..	..	..	..	..	12.5	9.9	1.5	6.2	9.8	3	1.2	14.7	87	61	82
271	1926-27	16-7-27	"	..	..	..	..	20	186	6.89	15.97	14.0	96.6	6.4	1,352	..	..	..	..	14.3	12.9	12.4	5.0	8.1	7.9	3	1.1	15.7	86	76	73
1008/1	1930-31	18-3-31	"	..	..	..	..	7	195	5.86	15.97	14.1	82.1	4.7	1,158	14.4	152.0	1.8	2,189	14.4	12.3	12.2	4.5	7.7	9.1	4	1.2	15.2	83	67	67
1008/2	"	"	"	..	..	..	..	33	195	5.49	15.97	13.9	84.7	5.6	1,177	14.2	157.6	2.0	2,238	14.3	12.2	11.8	5.5	8.2	7.2	4	1.5	15.4	83	67	68
1008/1	1930-31	18-3-31	14C	..	..	..	..	13	202	5.86	16.85	13.7	96.8	3.8	1,326	14.2	168.8	1.7	2,397	13.9	13.9	10.4	2.5	7.9	8.7	4	1.5	16.1	81	66	69
1008/2	"	"	"	..	..	..	..	20	202	5.49	16.85	13.7	92.1	3.7	1,262	14.1	168.2	2.4	2,301	13.4	14.5	12.1	3.0	8.7	7.7	4	1.0	16.1	81	66	67
372	1927-28	17-4-28	16	..	..	..	..	0	198	6.18	15.97	16.1	77.2	5.4	1,243	..	..	..	..	16.0	10.8	11.0	2.2	8.0	9.4	4	4.5	15.3	88	65	69
494	1928-29	9-4-29	18	..	..	..	..	20	174	7.13	16.97	18.1	62.0	6.7	1,122	18.3	107.8	4.1	1,973	17.9	9.4	11.3	3.7	7.2	7.5	4	1.7	16.4	88	67	67

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

6.—PUNJAB-AMERICAN 4F.

Seasons ..	{	1924-25 (Sample No. 81).
		1925-26 (Sample No. 127).
		1926-27 (Sample No. 232).
		1927-28 (Sample No. 340).
		1928-29 (Sample No. 448).
		1929-30 (Sample No. 659).
		1930-31 (Sample No. 995).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A selection from acclimatized Punjab-American cotton Upland Georgian in origin; imported American cotton seed was first tried in the Punjab in 1853; the 4F selection was first distributed in 1913. (Reference: Report and Evidence of the Indian Cotton Committee, 1919.)
- (iii) *District of growth* :—Irrigated area of Punjab. The particular samples used in these tests have been grown on the farm of the British Cotton Growing Association (Punjab), Ltd., at Khanewal.
- (iv) *Growing period* :—Sown from the first week in May up to the end of May, and picked from the second week of October up to the second week of January.
- (v) *Soil* :—Alluvial loam.
- (vi) *Rainfall* :—Variable, 35 inches annually in the north-east, but much less towards the west and south, being only 6½ inches at Multan.
- (vii) *Temperature* :—Variable, below freezing point in December and January and rising to a maximum of 116°F. at Lyallpur and 125°F. at Multan in May and June.
- (viii) *Plant particulars* :—
- Bolls per plant: 9. (Spacing 36" × 15").
 - Seeds per boll: 29.
 - Weight of seed: 80 milligrammes.
 - Weight of lint per seed: 40 milligrammes.
 - Ginning percentage: 32½.
- (ix) *Yield of seed-cotton* :—
- 530 lbs. per acre (normal).
996 lbs. per acre (B.C.G.A. Farm, Khanewal, 1921-25).
- (x) *Area under cultivation* :—
- Season 1913-14; 1917-18; 1924-25; 1925-26; 1926-27; 1927-28; 1928-29; 1929-30.
- Acres .. 80; 180,000; 1,000,000; 1,049,000; 1,127,000; 754,000; 767,000; 793,000.
- The crop for 1923-24 was estimated at 560,000 bales.

II. GRADER'S REPORT.

	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under ..	..	..	Broach.	Broach.	Broach.	Broach.	Broach.
Class	Fine Punjab-American.	Punjab-American.	Fully Good.	Fine.	Fully Good.	Fully Good.	Fine.
Colour .. ..	..	White.	White.	White.	White.	White.	White.
Staple Length ..	¾-1 inch.	¾ inch.	¾-1 inch.	¾-1 inch.	¾-1 inch.	¾ inch.	¾ inch.
Staple Strength ..	Good.	Good.	Poor.	Fair.	Fair.	Fair.	Fair.
Regularity .. ..	..	Regular.	Poor.	Fair.	Poor.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	Rs. 20 on.	Rs. 65 on.	Pass.	Rs. 35 on.	Rs. 40 on.
Basis .. ..	..	..	Rs. 289.	Rs. 382.	Rs. 365.	Rs. 265.	Rs. 217.
Date of Valuation ..	..	..	2-4-27.	5-1-28.	4-12-28.	7-2-30.	5-3-31.
Remarks .. ..	..	..	Seedy.	..	Very mixed.	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.2	..	0.4	0.2	0.9	0.8	0.3
3	2.0	1.8	1.8	2.3	2.5	1.9	2.7
4	4.9	4.5	5.4	4.8	6.0	4.6	5.3
5	11.6	10.5	15.4	13.6	16.9	11.4	16.7
6	25.5	28.5	33.2	32.7	35.6	26.8	34.9
7	37.6	39.6	29.3	33.8	27.9	35.5	27.9
8	14.5	12.1	12.0	10.2	8.1	14.6	8.8
9	3.3	2.3	2.5	2.1	2.1	4.2	2.8
10	0.4	0.7	..	0.3	..	0.2	0.4
11	..	..	..	..	..	..	0.2
2. Fibre-Length (inch):—							
(a) By Balls Sorter	0.81	0.81	0.79	0.79	0.76	0.81	0.77
(b) By Baer Sorter	0.80	0.82	0.77	0.79	0.76	0.82	0.77
3. Fibre-Weight per inch (millionth of an ounce)							
	0.177	0.174	0.134	0.186	0.197	0.155	0.198
4. Fibre-Strength (oz.):—							
(a) By Balls Tester .. ..	..	..	0.134	0.148	0.168	0.166	0.178
(b) By O'Neill Tester .. ..	..	..	0.130	0.165	0.170	0.168	0.185
5. Fibre-Strength per unit fibre-weight per inch							
	..	..	0.99	0.84	0.86	1.08	0.92
6. Fibre-Rigidity (millionth of an ounce, square inch)							
	..	..	0.093	0.210	0.234	0.215	0.226
7. Ribbon-Width (thousandth of an inch)							
	0.70	0.70	0.70	0.70	0.68	0.69	0.71
8. Convolution per inch							
	103	115	104	102	99	107	110

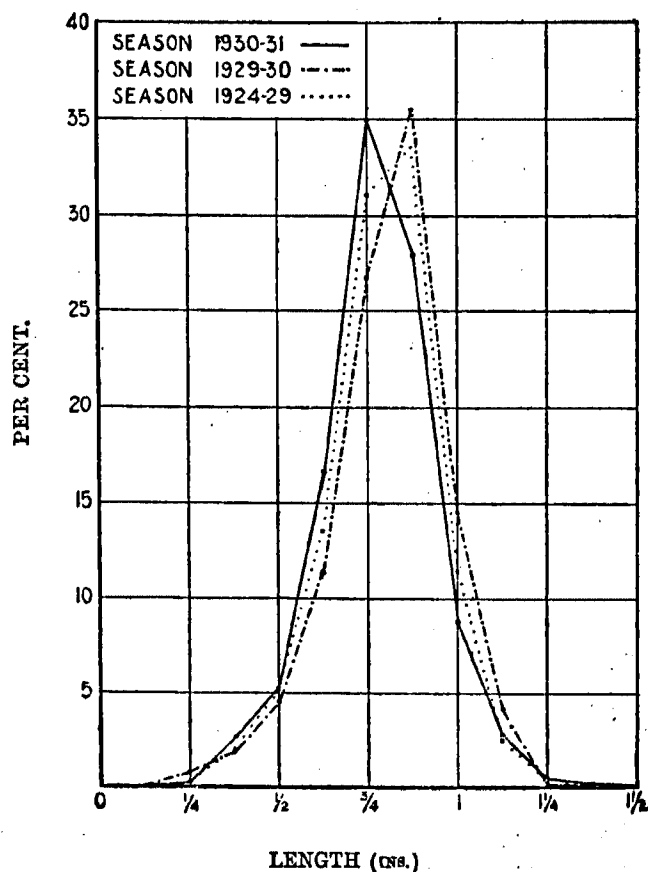


FIG. 6.—Sorter Diagrams for Punjab-American 4F.

IV. SPINNING TESTS.

1. *Treatment*:—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1.
2. *Spinning Master's Report*:—
 - 1924-25 cotton: white, a little leafy, but free from seed and nep.
 - 1925-26 cotton: white and bright but leafy.
 - 1926-27 cotton: creamy to creamy-white; very leafy; contains a few full clean seeds, and too many undeveloped seeds (1.11 per cent.); nepped and knotted in ginning, blow-room waste is mostly leaf with undeveloped seeds and a little short stuff; card web neppy.
 - 1927-28 cotton: white to creamy-white, and bright; fairly clean and well-ginned; has a good feel; a good sample.
 - 1928-29 cotton: creamy-white; fairly bright; a trifle leafy but well-ginned; has a silky and bodied feel; a very good cotton. Frequent breakages on the ring frame made it necessary to reduce the spinning speed for the 20's yarns.
 - 1929-30 cotton: white; leafy; bright; has a nice soft feel; ginning has left the lint in a knotted and nepped condition but it has responded to subsequent treatment giving a fairly clear card web; staple is regular in length and of good strength.
 - 1930-31 cotton: white; fully pressed; bright; fairly clean; has a very good feel; well-ginned; the card web is very good, sliver clean; ten flat strips weigh 16.3 grams.
3. *Spinning Test Results*:—See Table 6, page 45.
 - Card Production for Sample 81:—11.7 lb. per hour.
 - Ring Frame Production for 20's A, Sample 81:—7.71 oz. per spindle per 10 hours.

V. REMARKS.

Fibre.—The fibre-length is fairly constant in all seasons except 1928-29 and 1930-31 when it is rather low. The fibre weight per unit length and the fibre-rigidity both show much seasonal variation, being very low in 1926-27 and high in 1928-29. The fibre-strength shows a progressive increase since 1926-27 when it was first measured. Ribbon-width is constant throughout but convolutions per inch show small fluctuations.

Waste.—The blow-room loss and card-room loss are both low in 1925-26 and 1927-28, rather high in 1926-27 and 1928-29, and highest of all in 1929-30.

Breakages.—Yarn breakages in the ring frame were rather numerous for the 20's counts of the 1924-25 cotton spun with 16.85 turns per inch, for both 20's yarns of the 1928-29 and 1929-30 cottons, and for all the 1930-31 yarns.

Yarns.—During the four seasons 1924-28 the yarns of this cotton do not show much variation in strength, evenness or neppiness, those of 1926-27 being comparatively stronger but more neppy. The yarns of 1928-29 are very weak and, together with those of 1929-30, less even and more neppy than in the previous seasons. The yarns of 1930-31 are similar in every respect to those of the first four seasons.

Conclusions.—The year 1928-29 was decidedly a bad one for this cotton when the staple was short, the waste and the number of yarn breakages in the ring frame high, and the yarns comparatively weak, uneven and neppy. However, the set-back has proved temporary as the cotton has steadily improved since then and the results for the 1930-31 cotton generally resemble those of the first four seasons. The following are the highest standard warp counts for which the cotton is suitable in the different seasons:—

1924-25 ..	22's.	1928-29 ..	16's.
1925-26 ..	22's.	1929-30 ..	20's.
1926-27 ..	24's.	1930-31 ..	22's.
1927-28 ..	22's.		

TABLE 6.—SPINNING TEST RESULTS FOR PUNJAB-AMERICAN 4F.
TRAVELLER COUNTS.

SPINDLE SPEED (1930-31).

HANK (1930-31).
Draw-frame .. 0.18
Slubber .. 0.75
Inter .. 1.65
Rover .. 4.60

20^s 3/0

20^s 9,700 r. p. m.

24^s A 9,500 r. p. m.

24^s 5/0

24^s B 10,300 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.											TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)								
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count Strength Product.	Counts Actual.	Work of rupture. (inch.-lbs.)	Work Irregularity (%).	Count-Work Product.	Count.	Strength (ozs.)	Strength Irregularity (%).		Weakness Percentage.	Extension (%).	Extension Irregularity (%).				Evenness Class.	Neps per yard.	Turns per inch Actual.
448	1928-29	4-12-28	16	..	..	..	..	14	196	4.00	15.97	16.0	78.3	6.4	1,253	..	..	..	..	15.4	12.4	15.3	9.7	8.4	9.8	4	3.3	15.4	84	68	67
659	1929-30	31-1-30	"	..	..	..	..	11	202	4.42	15.97	15.6	93.4	6.4	1,457	15.9	163.4	3.9	2,598	16.1	13.2	11.2	2.2	8.3	6.3	4	2.7	15.4	81	61	66
81	1924-25	23-12-25	20A	..	..	..	..	22	181	5.27	16.85	19.3	65.1	6.8	1,256	..	..	..	..	..	8.7	13.6	7.0	4.7	17.5	5	1.4	..	73	75	61
127	1925-26	13-5-26	"	..	..	..	..	2	180	4.60	16.85	19.5	67.7	7.3	1,320	..	..	..	..	..	9.3	12.3	5.5	5.2	16.3	3	1.4	..	91	63	58
232	1926-27	12-5-27	"	..	..	..	..	10	191	5.32	16.85	19.8	75.2	4.6	1,489	..	..	..	..	..	10.1	10.7	3.5	5.9	6.6	3	3.1	16.3	88	63	78
340	1927-28	5-1-28	"	..	..	..	..	37	187	5.21	16.85	19.4	66.5	6.5	1,290	..	..	..	..	..	9.2	13.5	6.5	7.4	9.9	3	1.9	16.3	81	69	65
448	1928-29	3-12-28	"	..	..	..	..	67	175	5.23	16.85	19.9	43.5	8.7	866	..	..	..	..	..	8.0	15.6	9.5	7.3	8.9	5	4.3	16.4	83	47	70
659	1929-30	30-1-30	"	..	..	..	..	50	183	5.53	16.85	19.6	53.6	10.5	1,050	19.8	100.7	4.4	2,192	20.2	8.9	13.6	6.7	7.4	8.4	5	3.3	16.2	83	62	63
81	1924-25	23-12-25	20B	7.9	8.2	1.0	16.3	17	170	5.33	17.98	19.2	73.6	5.4	1,413	..	..	..	..	..	3.9	13.2	6.0	4.4	20.5	4	1.9	..	73	75	58
127	1925-26	13-5-26	"	6.7	6.5	0.4	13.1	0	169	4.70	17.98	19.6	76.0	5.6	1,490	..	..	..	..	..	10.3	11.1	3.7	5.1	15.2	4	1.6	..	92	61	59
232	1926-27	12-5-27	"	9.5	9.5	0.3	18.4	7	191	5.37	17.98	20.1	80.1	3.8	1,610	..	..	..	..	..	11.0	10.4	2.2	9.3	6.5	3	2.2	17.5	88	64	79
340	1927-28	5-1-28	"	6.4	7.8	0.3	14.0	22	186	5.31	17.98	19.9	69.7	5.8	1,387	..	..	..	..	..	9.8	12.3	4.0	7.5	9.2	3	1.4	17.3	82	68	66
448	1928-29	4-12-28	"	8.6	10.0	0.5	18.2	46	188	5.13	17.98	20.1	52.9	10.3	1,063	..	..	..	..	..	8.9	13.8	8.5	7.6	10.3	5	4.0	17.4	83	67	69
659	1929-30	30-1-30	"	9.5	11.7	0.5	20.5	62	190	5.53	17.98	19.3	69.2	5.8	1,336	19.6	117.0	4.3	2,293	20.2	9.9	10.6	3.7	7.8	9.7	4	2.8	17.2	84	60	66	
995/1	1930-31	7-3-31	"	6.9	9.0	0.6	15.8	29	194	5.21	17.98	20.1	72.8	7.4	1,463	20.1	121.2	2.7	2,436	20.4	9.5	17.3	12.0	6.7	9.2	3	1.0	16.9	80	72	69	
995/2	"	"	"	7.8	8.3	0.5	16.0	40	194	5.32	17.98	19.8	71.3	5.7	1,412	19.9	126.4	3.3	2,615	20.3	9.9	13.1	6.0	6.6	7.4	3	1.2	17.4	80	72	68	
81	1924-25	30-12-25	20C	..	..	..	..	12	158	5.33	19.26	19.3	76.6	5.9	1,478	..	..	..	..	..	10.7	10.2	2.0	4.5	16.6	4	1.0	..	79	82	58
127	1925-26	14-5-26	"	..	..	..	..	10	159	4.76	19.26	19.6	82.6	4.0	1,619	..	..	..	..	..	11.1	11.8	1.2	5.1	17.1	3	1.4	..	90	67	60
340	1927-28	6-1-28	24A	..	..	..	..	32	176	6.31	19.73	23.7	53.9	6.4	1,277	..	..	..	..	..	7.9	15.6	8.5	7.1	9.5	4	1.9	18.8	82	69	65
995/1	1930-31	7-8-31	"	..	..	..	..	55	177	6.10	19.73	24.1	52.6	7.5	1,268	23.8	99.8	2.8	2,375	24.5	7.5	16.2	14.0	6.4	10.9	4	1.2	18.4	81	69	69
995/2	"	"	"	..	..	..	..	45	177	6.41	19.73	24.1	51.9	8.5	1,251	24.4	101.0	3.0	2,464	24.5	7.7	14.4	9.5	6.0	8.5	5	1.5	19.1	81	69	69
995/1	1930-31	9-3-31	24B	..	..	..	..	60	183	6.25	20.74	24.3	55.9	8.2	1,358	24.4	97.6	3.8	2,381	24.8	7.6	17.1	13.5	6.2	12.3	4	1.0	19.6	81	69	67
995/2	"	"	"	..	..	..	..	40	183	6.41	20.74	24.4	54.3	8.0	1,325	24.8	100.2	3.5	2,485	25.0	7.7	17.7	10.5	6.0	11.0	4	1.2	19.0	81	69	69
232	1926-27	13-5-27	80	..	..	..	..	8	148	7.85	21.86	29.4	44.7	4.9	1,314	..	..	..	..	..	6.8	14.1	6.5	7.8	10.7	6	2.5	21.2	88	63	78

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0	0.3	0.3	1.0	0.4	0	0.4
3	1.5	1.5	2.0	2.2	1.8	1.6	2.3
4	2.3	2.8	4.3	4.8	3.1	2.3	3.6
5	4.6	4.3	6.9	7.8	6.1	4.6	6.5
6	7.9	7.2	9.2	12.2	9.6	7.6	10.2
7	16.0	14.3	15.4	16.8	15.9	13.8	18.3
8	25.4	24.5	24.0	24.0	27.7	23.7	23.9
9	24.2	28.3	23.7	20.2	23.0	25.4	21.4
10	12.8	12.5	10.5	8.3	9.9	14.2	10.3
11	4.1	3.8	3.4	2.5	2.5	5.5	3.0
12	1.2	0.5	0.3	0.2	..	1.3	0.1
2. Fibre-Length (inch) :—							
(a) By Balls Sorter	1.01	1.00	0.96	0.93	0.97	1.01	0.95
(b) By Baer Sorter	1.02	1.00	0.98	0.95	0.96	0.99	0.97
3. Fibre-Weight per inch (millionth of an ounce)	0.125	0.125	0.098	0.142	0.122	0.142	0.142
4. Fibre-Strength (oz.) :—							
(a) By Balls Tester .. ..	..	..	0.120	0.124	0.148	0.149	0.132
(b) By O'Neill Tester .. ..	..	..	0.098	0.146	0.155	0.148	0.145
5. Fibre-Strength per unit fibre weight per inch .. ..	..	..	1.11	0.95	1.24	1.05	0.98
6. Fibre-Rigidity (millionth of an ounce, square-inch) .. ..	..	..	0.053	0.092	0.093	0.101	0.129
7. Ribbon-Width (thousandth of an inch.)	0.69	0.68	0.62	0.62	0.58	0.61	0.62
8. Convolutions per inch	122	125	88	118	122	145	136

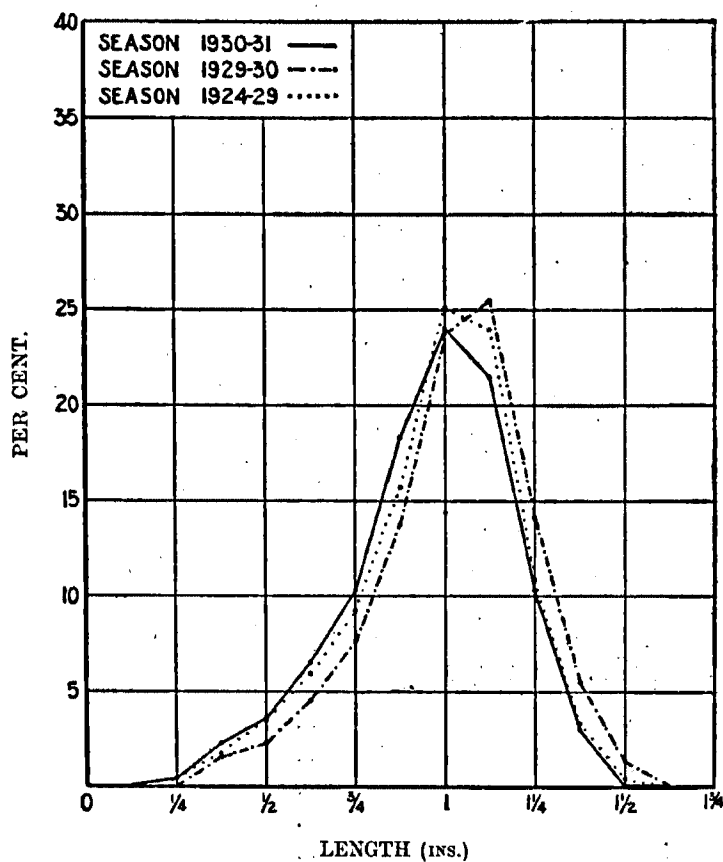


FIG. 7.—Sorter Diagrams for Punjab-American 289 F.

IV. SPINNING TESTS.

1. *Treatment*:—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1.
2. *Spinning Master's Report*:—
 - 1924-25 cotton: fairly free from seed, but leafy and very neppy.
 - 1925-26 cotton: creamy and bright, but leafy; a little seedy and very neppy.
 - 1926-27 cotton: creamy, stained, and very leafy; contains a deal of cut seed with a few ginned seeds and a fair amount of undeveloped seed; nepped and knotted in ginning; a poor sample; lap a little too leafy and knotty; card web very neppy.
 - 1927-28 cotton: creamy-white; bright with a nice soft feel; fairly clean, well-ginned except for a little knot; a very desirable cotton.
 - 1928-29 cotton: creamy-white; bright; clean; has a good silky feel; well-ginned; fibre is strong; a good sample.
 - 1929-30 cotton: creamy; fairly clean; fairly bright; has a good soft feel; ginning has cut the seeds badly and left the lint in a knotted and somewhat nepped condition; staple is fine, regular in length, and very strong; a very desirable cotton.
 - 1930-31 cotton: white to creamy-white; fully-pressed; a little leafy; has a good silky feel; fairly well-ginned; the card web is first class, sliver clean and flat strips light, ten of them weighing 14.8 grams. It is a very desirable sample.
3. *Spinning Test Results*:—See Table 7, page 49.
 - Card Production for Sample No. 80:—11.9 lb. per hour.
 - Ring Frame Production for 40's, Sample 80:—2.42 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The fibre properties are subject to seasonal variations which are generally small but occasionally quite large. The fibre-length is rather short in 1927-28, and the fibre-weight per inch is very low in 1926-27. The fibre-strength is high in 1928-29 and 1929-30, and the number of convolutions in 1929-30 and 1930-31. The fibre-rigidity is very low in 1926-27.

(ii) *Waste*.—The blow-room loss is normal in all seasons, except 1926-27 and 1928-29. The card-room loss is generally on the high side.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few, the only exceptions being 1928-29 and 1930-31 when they were rather numerous in 40's counts.

(iv) *Yarns*.—The yarns of this cotton are considerably weaker in 1924-25 and 1925-26, and stronger in 1930-31, than in the other seasons. The yarns of 1924-25 are the least even while those of 1928-29 are less even than the others. This cotton has generally given neppy yarns, the worst years being 1926-27 and 1928-29, but the yarns of 1930-31 cotton are very much better in this respect.

(v) *Conclusions*.—Hitherto the neppiness of this cotton has seriously detracted from its value, but the 1930-31 cotton is a great improvement upon its predecessors. The following are the highest standard warp counts for which the cotton is suitable in the different seasons:—

1924-25	..	34's.
1925-26	..	32's.
1926-27	..	40's.
1927-28	..	42's.
1928-29	..	39's.
1929-30	..	42's.
1930-31	..	44's.

TABLE 7.—SPINNING TEST RESULTS FOR PUNJAB-AMERICAN 289 F.

HANK (1930-31)
 Draw-frame .. 0.19
 Slubber .. 0.81
 Inter .. 1.86
 Rover .. 4.76

TRAVELLER COUNTS.
 20s 3/0
 30s 7/0
 40s 12/0

SPINDLE SPEED (1930-31.)
 20A 9,350 r. p. m.
 20B 9,600 r. p. m.
 30 9,600 r. p. m.
 40 10,600 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.															TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).				
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.		
												Counts Actual.	Strength (lbs).	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of nature (inch lbs.)	Work Irregularity (%)	Count-Work product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%).	Extension Irregularity (%).	Evenness Class.					Neps per Yard.	Turns per inch Actual.
80	1924-25	14-12-25	20A	8.7	9.0	0.4	17.2	22	181	4.81	16.85	20.4	88.5	8.5	1,805	..	..	..	..	11.7	8.2	2.2	6.5	8.8	4	5.6	..	74	72	61
130	1925-26	10-5-26	..	8.4	9.3	0.6	17.4	22	183	4.65	16.85	20.2	84.2	9.7	1,701	..	..	..	..	12.9	9.5	3.5	5.5	8.8	2	7.5	..	91	62	64
234	1926-27	26-5-27	..	12.7	12.1	0.3	23.6	5	191	4.58	16.85	19.3	107.5	7.4	2,075	..	..	..	..	14.8	9.5	1.2	7.6	8.3	2	28.7	16.4	90	65	70
341	1927-28	6-1-28	..	8.5	10.5	0.2	18.3	0	191	4.51	16.85	19.6	104.2	5.3	2,042	..	..	..	..	14.2	10.1	1.5	6.5	8.5	2	4.9	16.3	83	69	66
449	1928-29	5-12-28	..	10.8	13.4	0.2	23.0	7	193	4.49	16.85	20.6	89.3	5.0	1,839	..	..	..	..	12.8	11.5	3.7	6.9	8.2	3	16.4	16.2	84	66	68
660	1929-30	31-1-30	..	7.5	11.7	0.2	18.5	2	190	4.76	16.85	19.3	109.2	7.0	2,108	19.5	156.0	3.9	3,042	19.7	14.2	9.2	2.0	6.7	8.8	2	5.3	16.3	82	61	68	
904/1	1930-31	5-3-31	..	8.4	9.6	0.5	17.6	6	197	4.65	16.85	20.0	107.9	8.9	2,158	20.5	147.4	3.5	3,022	20.6	13.8	9.1	0.5	7.0	6.4	3	2.0	10.1	82	68	67	
904/2	8.6	10.0	0.5	18.2	0	197	4.55	16.85	20.3	105.3	3.7	2,138	20.4	147.8	4.9	3,015	20.5	14.1	9.6	0.5	6.6	8.4	3	3.0	16.2	82	68	69	
660	1929-30	31-1-30	20B	12	189	4.94	17.98	20.0	106.4	5.2	2,128	20.1	151.8	4.1	3,051	20.4	14.0	9.5	1.2	6.7	8.5	3	5.7	17.5	82	64	67	
904/1	1930-31	5-3-31	11	198	4.65	17.98	19.9	113.2	3.8	2,253	20.2	161.8	4.3	3,268	19.9	15.4	9.3	3.0	7.3	7.7	3	2.5	17.1	60	67	70	
904/2	6	198	4.55	17.98	20.1	111.2	4.0	2,235	20.3	161.2	3.4	3,272	20.7	14.7	10.3	2.0	6.7	5.7	3	2.7	17.1	80	67	69	
80	1924-25	15-12-25	30	..	..	..	..	8	140	7.05	21.86	29.6	59.8	13.7	1,504	..	..	..	..	7.6	11.6	6.5	6.0	13.5	6	6.2	..	76	74	60
130	1925-26	20-5-26	..	..	..	..	..	15	140	6.90	21.86	29.3	49.4	12.1	1,447	..	..	..	..	8.3	14.1	12.0	4.6	9.6	3	8.2	..	91	63	62
234	1926-27	27-5-27	..	..	..	..	..	8	158	6.80	21.86	29.2	60.3	6.4	1,761	..	..	..	..	9.2	11.0	2.5	6.8	8.1	4	21.7	21.5	89	65	78
341	1927-28	7-1-28	..	..	..	..	..	3	157	6.84	21.86	30.1	60.4	5.0	1,818	..	..	..	..	9.0	11.6	3.0	5.4	10.7	4	5.4	21.3	82	67	66
449	1928-29	6-12-28	..	..	..	..	..	10	159	6.50	21.86	30.2	58.8	4.5	1,776	..	..	..	..	8.4	11.4	4.0	6.3	9.6	5	15.3	20.9	83	67	68
660	1929-30	1-2-30	8	159	7.15	21.86	28.9	63.3	6.2	1,829	29.2	88.6	4.9	2,587	29.4	9.0	12.2	4.5	5.9	10.8	4	6.7	21.1	80	61	66	
904/1	1930-31	5-3-31	11	163	6.90	21.86	30.1	63.1	4.7	1,899	30.9	82.8	5.2	2,559	29.5	9.5	11.0	3.0	6.4	9.2	4	3.5	21.0	81	68	68	
904/2	15	163	7.07	21.86	32.2	53.8	6.4	1,732	32.7	89.2	2.6	2,917	32.8	7.9	11.6	2.0	6.0	10.0	4	2.7	20.7	81	68	70	
80	1924-25	15-12-25	40	..	..	..	..	13	115	9.20	26.97	38.3	34.0	12.5	1,302	..	..	..	..	5.7	14.3	9.2	5.5	13.7	9	5.6	..	74	72	53
130	1925-26	21-5-26	..	..	..	..	..	9	115	9.14	26.97	38.3	34.9	13.8	1,337	..	..	..	..	6.2	15.2	17.0	4.2	10.9	5	7.7	..	91	62	64
234	1926-27	30-5-27	..	..	..	..	..	6	133	9.05	26.97	38.2	43.1	5.7	1,646	..	..	..	..	6.8	11.6	3.7	6.4	10.6	5	20.0	26.0	91	63	78
341	1927-28	9-1-28	..	..	..	..	..	7	133	9.05	26.97	40.5	40.1	4.9	1,624	..	..	..	..	6.4	12.9	5.0	4.8	14.9	5	5.0	25.8	82	67	65
449	1928-29	6-12-28	..	..	..	..	..	21	131	8.75	26.97	40.3	38.0	4.7	1,531	..	..	..	..	6.0	14.3	8.7	5.6	12.2	7	14.1	25.8	84	65	68
660	1929-30	3-2-30	12	134	9.55	26.97	39.3	41.7	5.9	1,639	39.1	60.8	5.4	2,377	40.9	5.9	13.3	6.5	5.2	12.3	5	7.2	25.9	82	63	64	
904/1	1930-31	6-3-31	20	139	9.11	26.97	40.6	42.0	4.9	1,705	41.4	72.6	2.3	3,006	42.1	6.1	16.7	12.0	5.0	16.8	5	2.2	20.3	81	65	69	
904/2	23	139	9.11	26.97	39.6	42.7	4.0	1,691	39.9	76.0	3.3	3,032	40.4	6.5	14.4	5.5	5.2	10.2	5	3.5	26.0	81	65	68	

* Diameter of ring frame front roller— $\frac{1}{8}$ ". Diameter of rings— $\frac{1}{16}$ ".

8.—MOLLISONI (Bengals).

Seasons ..	{	1925-26 (Sample No. 122):
		1926-27 (Sample No. 230).
		1927-28 (Sample No. 324).
		1928-29 (Sample No. 450).
		1929-30 (Sample No. 643).
		1930-31 (Sample No. 996).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium indicum var Mollisoni*, Gammie.
- (ii) *History* :—A selection from a Punjab indigenous desi cotton; it was first issued about 1914.
- (iii) *District of growth* :—Irrigated area of Punjab. The particular samples used in these tests have been grown on the Farm of the British Cotton Growing Association (Punjab), Limited, at Khanewal.
- (iv) *Growing period* :—Sown from the first week in May up to the end of May, and picked from the first week in October up to the last week in January.
- (v) *Soil* :—Alluvial loam.
- (vi) *Rainfall* :—Variable, 35 inches annually in the north-east, but much less towards the west and south, being only 6½ inches at Multan.
- (vii) *Temperature* :—Variable—below freezing point in December and January and rising to a maximum of 116° F. at Lyallpur and 125° F. at Multan in May and June.
- (viii) *Plant particulars* :—
- (a) Bolls per plant : 20 (spacing : 30" × 15").
- (b) Seeds per boll : 24.
- (c) Weight of seed : 50 milligrammes.
- (d) Weight of lint per seed : 32 milligrammes.
- (e) Ginning percentage : 36.
- (ix) *Yield of seed-cotton* :—1,207 lbs. per acre (B. C. G. A. Farm, Khanewal, 1921-25). 1,799 lbs. per acre in 1929-30.
- (x) *Area under cultivation* :—1927-28 : 2,66,000 acres.
 1928-29 : 3,68,600 ,,
 1929-30 : 1,85,800 ,,

The higher prices prevailing for cotton in 1927-28 led to some increase in the area sown in 1928-29.

II. GRADER'S REPORT.

	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under .	..	Bengal.	Oomra.	Bengal.	Broach.	Oomra.
Class	Barely fine.	Fine.	Barely fine.	Extra Superfine	Fully good.	Barely fine.
Colour	White.	White.	White.	White.	White.	White.
Staple Length	5/8 inch.	5/8 inch.	3/4-7/8 inch.	5/8 inch.	3/4 inch.	13/16 inch.
Staple Strength	Strong.	Fair.	Fair.	Fair.	Fair.	Fair.
Regularity .. .. .	..	Fair.	Fair.	Fair.	Fair.	Fair.
Value above or below contract rate .. ..	..	Rs. 20 on.	..	Rs. 40 on.	Rs. 25 off.	Rs. 25 on.
Basis .. .. .	..	Rs. 265.	..	Rs. 285.	Rs. 300.	Rs. 176.
Date of Valuation .. ..	..	2-4-27.	..	4-12-28.	7-1-30.	14-3-31.
Remarks .. .. .	..	..	Compares with C. P. I.	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.					
	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	1.2	1.4	..	1.3	0.3	1.1
3	2.4	2.9	2.6	3.6	2.4	3.7
4	6.5	11.1	7.3	9.5	8.8	11.4
5	23.3	34.9	24.1	27.6	31.7	34.5
6	46.0	38.8	39.2	41.5	40.4	34.0
7	15.4	8.9	21.6	12.7	13.0	11.2
8	4.4	2.0	4.8	3.5	3.4	3.6
9	0.8	..	0.4	0.3	..	0.5
2. Fibre-Length (inch):—						
(a) By Balls Sorter	0.72	0.68	0.73	0.70	0.70	0.68
(b) By Baer Sorter	0.71	0.69	0.73	0.68	0.68	0.70
3. Fibre-Weight per inch (millionth of an ounce)						
	0.321	0.272	0.335	0.303	0.272	0.287
4. Fibre-Strength (oz.):—						
(a) By Balls Tester .. .. .	..	0.167	0.205	0.182	0.173	0.168
(b) By O'Neill Tester .. .. .	..	0.162	0.186	0.182	0.161	0.172
5. Fibre-Strength per unit fibre-weight per inch						
	..	0.60	0.58	0.60	0.61	0.59
6. Fibre-Rigidity (millionth of an ounce, square-inch)						
	..	0.242	0.463	0.512	0.386	0.420
7. Ribbon-Width (thousandth of an inch) ..						
	0.70	0.77	0.88	0.76	0.81	0.76
8. Convolutions per inch						
	76	65	114	106	87	90

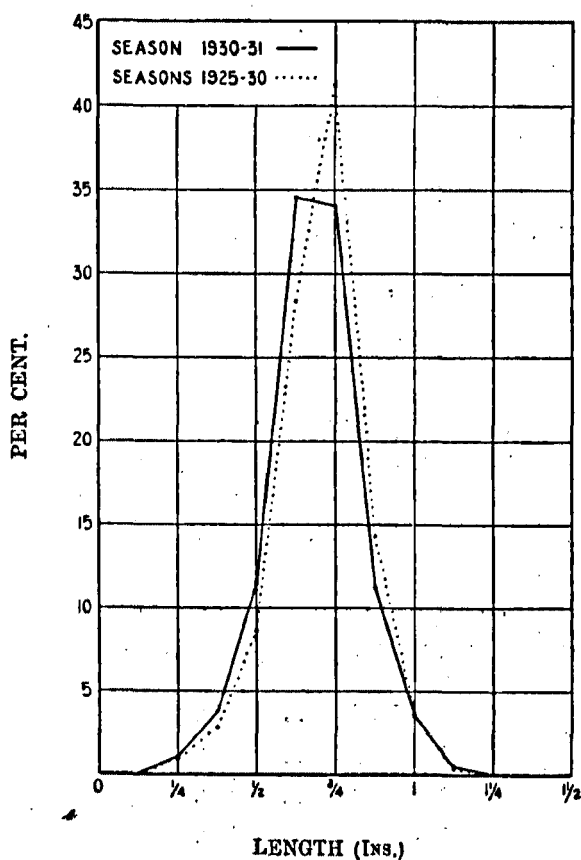


FIG. 8.—Sorter Diagrams for Mollisoni (Bengals).

IV. SPINNING TESTS.

1. *Treatment*.—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1930-31 cotton was passed twice through the Crighton; otherwise the treatment was the same as for the other cottons. The 1926-27 and 1927-28 cottons were passed through the Scutcher twice only. The 1928-29 cotton was passed twice through the Crighton; otherwise the treatment was the same as for the 1926-27 and 1927-28 cottons.
2. *Spinning Master's Report*.—
 - 1925-26 cotton : white, a little leafy ; harsh to feel.
 - 1926-27 cotton : creamy-white, and a trifle stained ; leafy ; a few undeveloped seeds present ; seedy (0.51 per cent.)—mostly full ginned seed ; similar in feel to K. 22 ; shed excessive fly in the blow-room and at the card.
 - 1927-28 cotton : clean, white ; well ginned, and harsh to feel.
 - 1928-29 cotton : clean ; white to creamy-white ; bright ; well-ginned ; has a roughish feel ; a very good sample of its class.
 - 1929-30 cotton : white ; fairly clean ; well-ginned ; has the typical harsh feel of its class.
 - 1930-31 cotton : white ; bright ; fairly clean ; has a good feel ; very well-ginned ; it is a very good sample of its class.
3. *Spinning Test Results*.—See Table 8, page 53.

V. REMARKS.

(i) *Fibre*.—Except in 1927-28 the fibre-length of this cotton is much the same in the different seasons. The fibre-weight per inch is rather variable, being low in 1926-27 and high in the following season. The fibre-strength per unit fibre-weight per inch is practically the same in all five seasons. The fibre-rigidity is very variable, its value in 1926-27 being less than half of that in 1928-29. The ribbon-width is low in 1925-26 and high in 1927-28. The number of convolutions is comparatively low in 1926-27, and high in the following two seasons.

(ii) *Waste*.—This cotton has usually been delivered in a fairly clean condition, giving a blow-room loss of about 5 per cent. The card-room loss is generally 7-8 per cent., though it was slightly higher in 1928-29 and 1929-30.

(iii) *Breakages*.—Yarn breakages in the ring frame are comparatively few in 6's and 8's counts in all seasons except 1929-30 and, to a less extent, 1930-31.

(iv) *Yarns*.—The yarns of this cotton vary considerably in evenness, 8^sA counts being even in 1927-28, fairly even in the preceding season and fairly even to uneven in 1925-26. All the yarns are free of neppiness. Except for a temporary set-back in 1928-29, the yarn strength results are much better since 1926-27.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons :—

1925-26	..	6's.
1926-27	..	8's.
1927-28	..	8's.
1928-29	..	7's.
1929-30	..	8's.
1930-31	..	8's.

TABLE 8.—SPINNING TEST RESULTS FOR MOLLISONI.

HANK (1930-31)
 Draw-frame .. 0.16
 Slubber .. 0.66
 Inter .. 1.06
 Rover.. .. 1.85

TRAVELLER COUNTS.

8° 7
 10° 5
 12° 3

SPINDLE SPEED (1930-31)

8° .. 6,775 r. p. m.
 10° .. 6,800 r. p. m.
 12° .. 7,200 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS. *				YARN TEST RESULTS.												TKM-TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).						
				Blow Room Loss.	Card Loom Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Spinning Loom.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of rupture (inch lbs.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.		Extension (%).	Extension Irregularity (%).	Evenness Class.				Neps per Yard.	Turns per Inch. Actual.
450	1928-29	8-12-28	6A	..	..	..	..	41	101	4.12	9.87	6.0	97.6	11.4	586	..	..	..	..	6.4	14.4	19.2	15.0	9.6	10.1	5	1.6	9.5	84	66	67
230	1926-27	9-5-27	6B	..	..	..	..	20	206	3.69	10.44	5.9	140.7	3.8	830	..	..	..	..	5.8	18.7	16.2	11.0	12.1	9.7	3	0.7	10.3	89	66	80
122	1925-26	20-4-26	8A	..	..	..	..	10	184	5.06	11.31	8.2	46.5	11.3	381	..	..	..	..	..	11.4	15.0	9.2	7.3	11.9	6	0.5	..	85	61	65
230	1926-27	7-5-27	"	..	..	..	..	10	174	4.77	11.31	7.5	91.3	5.4	685	..	..	..	..	7.4	14.0	17.4	12.7	11.9	10.6	5	0.5	11.1	99	64	80
324	1927-28	23-11-27	"	..	..	..	..	0	183	5.81	11.31	8.3	70.1	6.8	582	..	..	..	..	8.0	12.8	14.0	7.5	9.0	7.4	3	1.1	11.1	82	64	67
450	1928-29	7-12-28	"	..	..	..	..	23	175	5.33	11.31	7.9	58.7	9.9	464	..	..	..	..	8.1	11.0	18.4	15.0	9.1	11.5	5	1.5	11.4	84	66	66
122	1925-26	20-4-26	8B	5.1	7.7	1.2	13.4	0	174	5.06	12.07	8.0	76.5	10.3	612	..	..	..	..	..	13.0	18.2	14.7	7.5	12.7	6	0.7	..	84	61	68
230	1926-27	9-5-27	"	7.1	8.2	0.3	15.0	15	185	4.83	12.07	7.7	111.3	6.6	857	..	..	..	..	7.6	15.5	18.5	11.5	12.6	9.4	5	1.0	11.8	80	64	81
324	1927-28	23-11-27	"	4.0	6.7	0.3	10.7	20	200	5.53	12.07	7.9	101.8	8.4	804	..	..	..	..	8.2	13.5	16.4	11.5	9.0	8.6	4	1.2	11.8	83	66	68
450	1928-29	7-12-28	"	5.1	9.0	0.3	14.0	5	182	5.41	12.07	7.7	79.0	9.0	608	..	..	..	..	7.9	14.2	16.2	10.0	10.3	9.1	5	1.6	12.0	84	67	68
643	1929-30	10-1-30	"	7.8	9.2	0.5	16.8	40	195	4.42	12.07	7.8	93.4	7.2	728	7.9	258.4	3.8	2,041	8.1	14.6	15.8	11.2	9.7	8.6	5	1.2	11.6	84	68	65
996/1	1930-31	9-3-31	"	7.8	7.9	0.5	15.6	27	200	4.44	12.07	8.3	100.2	6.4	832	8.5	246.4	3.9	2,094	8.2	16.4	14.6	9.0	10.3	9.1	3	1.0	11.6	82	69	67
996/2	"	"	"	5.9	7.6	0.6	13.6	27	200	4.44	12.07	8.1	112.5	6.4	911	8.0	267.6	4.4	2,141	8.3	15.7	15.8	10.5	10.2	8.5	3	0.7	11.3	82	69	67
324	1927-28	23-11-27	10	..	..	..	..	35	179	7.08	13.58	9.9	68.9	6.9	682	..	..	..	..	10.1	11.3	14.6	7.0	8.4	11.3	5	1.6	13.2	81	66	68
643	1929-30	10-1-30	"	..	..	..	..	70	178	5.59	13.58	9.7	62.8	8.6	609	10.0	187.0	4.6	1,870	10.1	11.4	20.3	15.2	10.0	11.7	6	1.6	13.1	83	67	64
996/1	1930-31	9-3-31	"	..	..	..	..	30	185	5.41	13.58	9.9	73.6	9.9	729	9.7	209.6	4.0	2,033	10.1	13.0	15.0	9.5	9.7	9.4	4	1.0	13.0	83	65	67
996/2	"	"	"	..	..	..	..	20	185	5.56	13.58	9.9	70.2	9.8	695	10.2	186.0	3.0	1,897	9.8	13.7	13.9	7.0	10.2	7.7	4	1.5	12.9	83	65	65
643	1929-30	10-1-30	12	..	..	..	..	140	162	6.67	15.56	12.1	43.3	15.7	524	12.0	134.8	4.7	1,618	12.2	8.8	21.6	14.2	9.1	12.1	7	1.7	15.0	83	64	65
996/1	1930-31	10-3-31	"	..	..	..	..	56	167	6.49	15.56	12.0	54.8	6.5	658	12.2	165.2	2.5	2,015	11.9	11.1	12.7	5.0	9.4	8.7	5	1.2	14.9	81	70	67
996/2	"	"	"	..	..	..	..	64	167	6.67	15.56	11.8	56.8	6.6	664	12.0	162.0	3.5	1,944	11.6	11.3	14.6	8.5	9.5	10.8	6	1.2	14.9	81	70	69

* Diameter of ring frame front roller— $\frac{7}{8}$ ". Diameter of rings— $1\frac{1}{8}$ ".

9.—ALIGARH A. 19.

Seasons ..	{	1924-25 (Sample No. 22).
		1925-26 (Sample No. 111).
		1926-27 (Sample No. 227).
		1927-28 (Sample No. 352).
		1928-29 (Sample No. 482).
		1929-30 (Sample No. 693).
		1930-31 (Sample No. 948).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum roseum*.
- (ii) *History* :—A re-selection from Aligarh White Flower, itself a selected "Roseum" type of United Provinces *desi* (Bengals) cotton, a good yielder of high ginning percentage, with kapas of good colour, but coarse and very short. Single plant selections from Aligarh White Flower were first subjected to comparative field trials in 1917; by 1921, selection A. 19 had shown its superiority over all others tried, and from then onwards it was multiplied for distribution.
- (iii) *District of growth* :—Western districts of the United Provinces. The particular samples used in these tests have been grown on the Government Farm, Aligarh.
- (iv) *Growing period* :—Sown in the last week in May, and picked from the first week in October up to the last week in November.
- (v) *Soil* :—Alluvium of the Gangetic Plain. Soil is light loam and blur.
- (vi) *Rainfall* :—Variable—from 21 to 40 inches annually. In 1929-30 the cotton was grown under field conditions with canal irrigation. The crop suffered from drought.
- (vii) *Temperature* :—Means at Aligarh: 93° F. (June); 60° F. (December).
- (viii) *Plant particulars* :—
- Bolls per plant : 25 (spacing : 18" × 10").
 - Seeds per boll : 24.
 - Weight of seed : 54 milligrammes.
 - Weight of lint per seed : 34 milligrammes.
 - Ginning percentage : 38.
- (ix) *Yield of seed-cotton* :—918 lbs. per acre (average for 10 seasons, 1918-27 at Aligarh Farm).
- (x) *Area under cultivation* :—

1924-25	..	2,500 acres.
1925-26	..	5,000 "
1926-27	..	15,000 "
1927-28	..	30,000 "
1928-29	..	30,000 "
1929-30	..	45,000 "
1930-31	..	80,000 "

II. GRADER'S REPORT.

	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued	..	..	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.
under .. ..	..	..	Extra Superfine	Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.
Class	Fine.	Fine.	White.	White.	White.	White.	White.
Colour	Creamy.	White.	5/8 inch.	5/8 inch.	5/8 inch.	5/8 inch.	5/8 inch.
Staple Length ..	1/2 inch.	1/2 inch.	Fair.	Poor.	Good.	Good.	Fair.
Staple Strength ..	..	..	Fair.	Fair.	Good.	Fair.	Fair.
Regularity .. ..	..	..	..	..	..	..	..
Value above or below contract rate ..	..	..	Ra. 45 on.	Ra. 50 on.	Ra. 40 on.	Ra. 40 on.	Ra. 15 on.
Basis .. ..	..	..	Ra. 265.	Ra. 310.	Ra. 275.	Ra. 190.	Ra. 130.
Date of Valuation ..	..	..	2-4-27.	20-1-28.	18-3-29.	18-3-30.	7-1-31.
Remarks .. ..	..	Rough cotton.	..	..	..	..	..

III. FIBRE PARTICULARS.

I. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.8	0.8	0.5	0.4	0.5	0.8	1.8
3	2.9	2.5	3.6	2.9	2.8	3.0	4.4
4	8.7	7.2	12.8	9.0	9.5	9.8	13.7
5	26.1	24.0	43.8	30.1	27.1	31.1	42.1
6	40.8	41.4	33.0	41.0	42.0	37.6	28.1
7	17.5	20.6	5.5	14.0	14.4	13.4	8.5
8	3.1	3.1	0.8	2.6	3.7	3.7	1.4
9	0.1	0.4	..	..	..	0.6	..

2. Fibre-Length (inch):—							
(a) By Balls Sorter	0.71	0.72	0.66	0.70	0.71	0.70	0.65
(b) By Baer Sorter	0.72	0.72	0.66	0.70	0.72	0.67	0.67
3. Fibre-Weight per inch (millionth of an ounce)	0.287	0.303	0.301	0.305	0.324	0.277	0.301
4. Fibre-Strength (oz.):—							
(a) By Balls Tester .. ..	..	..	0.187	0.188	0.239	0.200	0.206
(b) By O'Neill Tester .. ..	..	..	0.188	0.211	0.212	0.222	0.203
5. Fibre-Strength per unit fibre-weight per inch .. ..	..	..	0.62	0.66	0.69	0.76	0.68
6. Fibre-Rigidity (millionth of an ounce, square-inch) .. ..	..	..	0.361	0.450	0.641	0.506	0.672
7. Ribbon-Width (thousandth of an inch)	0.78	0.82	0.79	0.82	0.74	0.78	0.77
8. Convolutions per inch	129	97	80	72	67	74	69

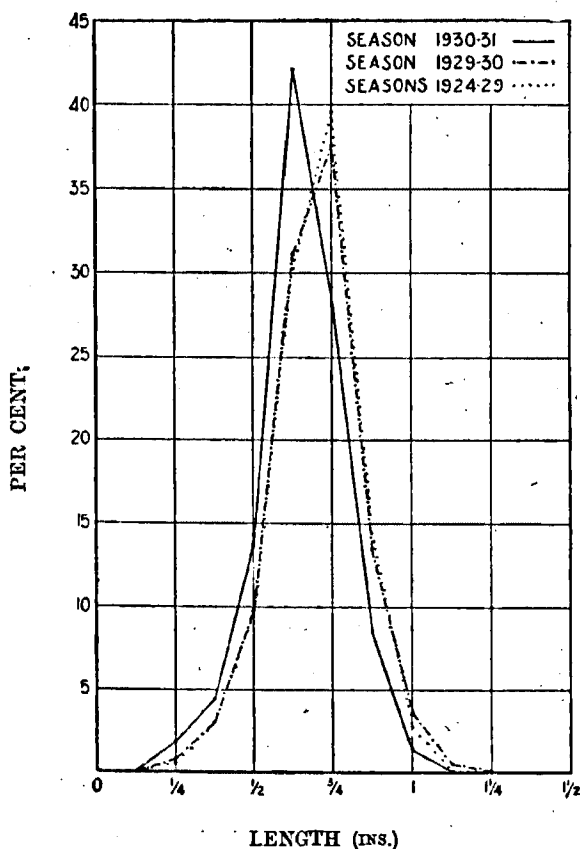


FIG. 9.—Sorter Diagrams for Aligarh A. 19—(Bengals.)

IV. SPINNING TESTS.

1. *Treatment* :—1924-25 cotton: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1925-26, 1926-27 and 1930-31 cottons were passed direct through the Crighton (once only), the 1927-28 and 1928-29 cottons were passed only once through the Crighton and twice through the Scutcher, and the 1929-30 cotton was passed only once through the Crighton and thrice through the Scutcher; otherwise these cottons were treated similarly to the 1924-25 cotton.
2. *Spinning Master's Report* :—
 - 1925-26 cotton: clean, white, and bright; blow-room waste practically all fibre.
 - 1926-27 cotton: creamy-white to whitish; it has the typical (harsh) feel of its class; web shedding high (0.41 per cent.); the whole of the card waste is fibre (fly).
 - 1927-28 cotton: creamy-white; clean; all the card waste is good clean fibre; a very fine sample.
 - 1928-29 cotton: white; perfectly clean; well ginned; has a very rough feel.
 - 1929-30 cotton: white; bright; perfectly clean; very well-ginned; has a good feel; it is a first rate sample of its class.
 - 1930-31 cotton: The cotton is perfectly clean, white in colour, well-ginned and has the typical harsh feel of its class.
3. *Spinning Test Details and Results* :—See Table 9, page 57.

V. REMARKS.

(i) *Fibre*.—The more important fibre-properties of this cotton do not show much seasonal variation. The fibre-length is comparatively low in 1926-27 and 1930-31; the fibre-weight per inch is low in 1924-25 and high in 1928-29. The fibre-strength is rather variable, being 13 per cent. higher in 1928-29 than in the preceding season. The fibre-strength per unit fibre-weight per inch is rather low in 1926-27. The fibre-rigidity is very high in 1928-29 and higher still in 1930-31. The ribbon-width is approximately the same in all seasons except 1928-29. The number of convolutions diminished steadily in the successive seasons, and in 1930-31 it is about half as much as in 1924-25.

(ii) *Waste*.—The samples of this cotton contained very little foreign matter. The card-room loss is rather high in 1930-31.

(iii) *Breakages*.—Yarn breakages in the ring frame were fairly numerous in 8's and 10's counts in all seasons and numerous in all counts in 1930-31.

Yarns.—The yarns of this cotton show considerable variation in evenness; thus the 8's yarns are even in 1925-26 and fairly even to uneven in the preceding and the following seasons. The yarns are conspicuously free from neppiness in all seasons. The yarn-strength results vary, to some extent, in the different seasons, being best of all in 1925-26, and better in 1930-31 than in the other seasons. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1924-25	..	7's.
1925-26	..	8's.
1926-27	..	7's.
1927-28	..	7's.
1928-29	..	7's.
1929-30	..	7's.
1930-31	..	7's.

TABLE 9.—SPINNING TEST RESULTS FOR ALIGARH A.19.
TRAVELLER COUNTS.

SPINDLE SPEED (1930-31).

HANK (1930-31).
Draw-frame .. 0.17
Slubber .. 0.64
Inter .. 1.08
Rover .. 1.76

6s 9
8s 7

6s 5,300 r.p.m.
8s B .. 5,600 r.p.m.
8s C .. 5,900 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Splicing Room.	Testing Room.		
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch lbs.)	Work Irregularity (%).	Count-work product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.		Extension (%).	Extension Irregularity (%).	Evenness Class.				Neps per Yard.	Turns per inch Actual.
482	1928-29	22-2-29	6A	..	..	..	..	50	183	4.04	9.87	6.0	108.0	9.6	636	..	..	..	..	6.1	19.0	19.7	15.0	8.7	12.3	3	1.1	9.7	84	65	66
693	1929-30	14-3-30	..	..	..	..	..	30	105	3.80	9.87	6.0	98.8	7.1	592	6.2	270.2	5.4	1,675	6.0	18.8	20.3	17.2	10.0	10.3	4	0.8	9.6	83	65	68
948/1	1930-31	6-1-31	..	..	..	..	..	100	204	3.69	9.87	6.2	97.3	7.9	603	6.5	281.6	4.2	1,830	6.4	17.6	17.6	12.0	9.2	10.7	3	0.5	9.4	81	69	69
948/2	..	..	..	..	..	..	..	120	204	3.69	9.87	6.2	112.0	6.6	694	6.4	280.0	5.4	1,792	6.5	17.7	16.6	12.0	8.0	8.1	3	0.5	9.6	81	69	69
227	1928-27	3-5-27	6B	..	..	..	..	20	175	3.60	10.44	5.8	116.5	3.9	676	..	..	..	..	..	18.7	15.2	7.0	9.7	12.1	6	0.4	..	88	65	64
352	1927-28	30-1-28	8A	..	..	..	..	65	173	5.19	11.31	8.0	68.6	7.6	549	..	..	..	..	8.0	12.5	21.1	16.7	6.8	12.0	4	1.1	11.0	85	38	40
482	1928-29	22-2-29	..	..	..	..	..	60	175	5.32	11.31	8.0	59.8	12.9	477	..	..	..	..	8.1	12.9	24.6	21.5	7.7	14.8	5	1.2	10.8	83	70	69
693	1929-30	13-3-30	..	..	..	..	..	65	178	5.00	11.31	8.1	51.1	10.2	414	8.2	184.0	4.2	1,509	8.4	10.8	21.9	18.7	8.4	10.8	5	1.1	11.0	85	66	69
22	1924-25	5-5-25	8B	4.6	7.5	1.2	12.8	20	200	4.80	12.07	7.7	82.0	15.6	631	..	..	..	..	..	17.7	16.1	9.2	5.2	19.6	6	0	..	90	65	76
111	1925-26	30-3-26	..	5.0	8.0	1.3	13.7	55	200	5.00	12.07	7.8	108.8	7.9	849	..	..	..	..	..	17.0	15.2	10.0	7.1	11.4	3	0.7	..	83	64	65
227	1928-27	3-5-27	..	3.8	7.9	0.3	11.7	35	172	4.72	12.07	7.8	75.1	7.5	586	..	..	..	..	..	15.6	13.6	4.5	8.9	9.4	6	0.5	..	87	63	64
352	1927-28	23-1-28	..	3.1	7.0	0.5	11.2	10	180	5.20	12.07	7.9	87.9	8.3	694	..	..	..	..	8.1	15.0	16.8	11.0	7.4	9.9	4	0.7	11.8	81	65	64
482	1928-29	22-2-29	..	3.3	6.7	0.3	10.1	85	180	5.37	12.07	8.0	80.7	9.9	846	..	..	..	..	8.0	16.2	18.1	12.2	8.6	9.4	6	0.8	11.6	84	68	71
693	1929-30	13-3-30	..	2.4	7.9	0.3	10.4	55	183	4.95	12.07	7.9	79.3	8.0	628	8.1	217.6	4.4	1,762	8.0	15.4	21.4	18.7	9.3	11.8	5	1.1	11.7	85	65	67	
948/1	1930-31	6-1-31	..	3.7	9.5	0.6	13.4	53	180	4.76	12.07	8.3	77.0	6.6	639	8.4	224.0	3.3	1,882	8.7	14.2	14.3	19.0	8.6	11.3	4	0.5	11.5	81	68	69	
948/2	..	..	..	3.6	10.4	0.6	14.1	53	180	4.76	12.07	7.9	92.1	6.0	728	8.1	249.2	3.4	2,019	8.1	17.5	15.9	10.5	8.7	11.4	4	0.7	11.0	81	68	69
948/1	1930-31	6-1-31	8C	..	..	..	..	80	190	4.88	12.63	8.1	98.7	4.7	799	8.4	239.6	3.5	2,013	8.4	17.5	18.6	14.5	9.2	9.8	4	1.0	12.2	80	69	70
948/2	..	..	..	..	..	..	..	107	190	4.88	12.63	8.2	98.9	7.5	811	8.5	234.0	3.8	1,989	8.5	17.9	18.2	13.0	8.4	10.4	4	1.0	12.2	80	69	69
22	1924-25	6-5-25	8D	..	..	..	..	15	189	4.90	13.58	7.8	123.2	8.3	961	..	..	..	..	..	22.7	11.8	5.6	6.2	15.9	6	0	..	90	83	76
22	1924-25	5-5-25	10	..	..	..	..	20	188	5.65	13.58	9.2	71.9	8.1	661	..	..	..	..	..	14.3	18.6	15.8	4.9	20.5	6	0.1	..	91	65	76
227	1928-27	2-5-27	..	..	..	..	..	40	169	5.80	13.58	10.1	42.5	11.1	429	..	..	..	..	..	10.5	21.1	15.0	7.3	13.0	8	0.6	..	88	65	64
352	1927-28	23-1-28	..	..	..	..	..	90	167	6.47	13.58	9.9	51.9	10.6	514	..	..	..	..	10.1	11.2	17.1	10.5	6.5	13.5	6	0.7	13.2	80	64	53

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

IV. SPINNING TESTS.

1. *Treatment*:—1924-25 cotton: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1925-26, 1926-27 and 1930-31 cottons were passed direct through the Crighton (once only), the 1927-28 and 1928-29 cottons were passed only once through the Crighton and twice through the Scutcher, and the 1929-30 cotton was passed only once through the Crighton and thrice through the Scutcher; otherwise these cottons were treated similarly to the 1924-25 cotton.
2. *Spinning Master's Report*:—
 - 1925-26 cotton: clean, white, and bright; blow-room waste practically all fibre.
 - 1926-27 cotton: creamy-white to whitish; it has the typical (harsh) feel of its class; web shedding high (0.41 per cent.); the whole of the card waste is fibre (fly).
 - 1927-28 cotton: creamy-white; clean; all the card waste is good clean fibre; a very fine sample.
 - 1928-29 cotton: white; perfectly clean; well ginned; has a very rough feel.
 - 1929-30 cotton: white; bright; perfectly clean; very well-ginned; has a good feel; it is a first rate sample of its class.
 - 1930-31 cotton: The cotton is perfectly clean, white in colour, well-ginned and has the typical harsh feel of its class.
3. *Spinning Test Details and Results*:—See Table 9, page 57.

V. REMARKS.

(i) *Fibre*.—The more important fibre-properties of this cotton do not show much seasonal variation. The fibre-length is comparatively low in 1926-27 and 1930-31; the fibre-weight per inch is low in 1924-25 and high in 1928-29. The fibre-strength is rather variable, being 13 per cent. higher in 1928-29 than in the preceding season. The fibre-strength per unit fibre-weight per inch is rather low in 1926-27. The fibre-rigidity is very high in 1928-29 and higher still in 1930-31. The ribbon-width is approximately the same in all seasons except 1928-29. The number of convolutions diminished steadily in the successive seasons, and in 1930-31 it is about half as much as in 1924-25.

(ii) *Waste*.—The samples of this cotton contained very little foreign matter. The card-room loss is rather high in 1930-31.

(iii) *Breakages*.—Yarn breakages in the ring frame were fairly numerous in 8's and 10's counts in all seasons and numerous in all counts in 1930-31.

Yarns.—The yarns of this cotton show considerable variation in evenness; thus the 8's yarns are even in 1925-26 and fairly even to uneven in the preceding and the following seasons. The yarns are conspicuously free from neppiness in all seasons. The yarn-strength results vary, to some extent, in the different seasons, being best of all in 1925-26, and better in 1930-31 than in the other seasons. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1924-25	..	7's.
1925-26	..	8's.
1926-27	..	7's.
1927-28	..	7's.
1928-29	..	7's.
1929-30	..	7's.
1930-31	..	7's.

TABLE 9.—SPINNING TEST RESULTS FOR ALIGARH A.19.

TRAVELLER COUNTS.

SPINDLE SPEED (1930-31).

HANK (1930-31).
 Draw-frame .. 0.17
 Slubber .. 0.64
 Inter .. 1.08
 Rover .. 1.76

6s 9

8s 7

6s 5,300 r.p.m.
 8s B 5,600 r.p.m.
 8s C 5,900 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).						
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Testing Room.		
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch lbs.)	Work Irregularity (%)	Count-work product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.		Extension (%)	Extension Irregularity (%)	Evenness Class.			Neeps per Yard.	Turns per inch Actual.
482	1928-29	22-2-29	6A	..	..	..	..	50	183	4.04	9.87	6.0	106.0	9.6	636	..	..	..	..	6.1	19.0	10.7	15.0	8.7	12.3	3	1.1	9.7	84	65	66
693	1929-30	14-3-30	"	..	..	..	..	30	195	3.80	9.87	6.0	98.6	7.1	592	6.2	270.2	5.4	1,675	6.0	18.8	20.3	17.2	10.0	10.3	4	0.8	9.6	83	65	68
948/1	1930-31	6-1-31	"	..	..	..	..	100	204	3.69	9.87	6.2	97.3	7.9	603	6.5	281.6	4.2	1,830	6.4	17.6	17.6	12.0	9.2	10.7	3	0.5	9.4	81	69	69
948/2	"	"	"	..	..	..	..	120	204	3.69	9.87	6.2	112.0	5.6	694	6.4	280.0	5.4	1,792	6.5	17.7	16.6	12.0	8.0	8.1	3	0.5	9.6	81	69	69
227	1926-27	3-5-27	6B	..	..	..	..	20	175	3.60	10.44	5.8	116.5	3.9	676	..	..	..	..	..	18.7	15.2	7.0	9.7	12.1	6	0.4	..	88	65	64
352	1927-28	30-1-28	8A	..	..	..	..	65	173	5.19	11.31	8.0	68.6	7.6	549	..	..	..	..	8.0	12.5	21.1	16.7	6.8	12.0	4	1.1	11.0	85	38	40
482	1928-29	22-2-29	"	..	..	..	..	60	175	5.32	11.31	8.0	59.6	12.9	477	..	..	..	..	8.1	12.9	24.6	21.5	7.7	14.8	5	1.2	10.8	83	70	69
693	1929-30	13-3-30	"	..	..	..	..	65	178	5.00	11.31	8.1	51.1	10.2	414	8.2	184.0	4.2	1,509	8.4	10.8	21.9	18.7	8.4	10.8	5	1.1	11.0	85	66	66
22	1924-25	5-5-25	8B	4.6	7.5	1.2	12.8	20	200	4.80	12.07	7.7	82.0	15.6	631	..	..	..	..	..	17.7	16.1	9.2	5.2	19.6	6	0	..	90	65	76
111	1925-26	30-3-26	"	5.0	8.0	1.3	13.7	55	200	5.00	12.07	7.8	108.8	7.9	849	..	..	..	..	..	17.0	15.2	10.0	7.1	11.4	3	0.7	..	83	64	65
227	1926-27	3-5-27	"	3.8	7.9	0.3	11.7	35	172	4.72	12.07	7.8	75.1	7.5	586	..	..	..	..	..	15.6	13.6	4.5	8.9	9.4	6	0.5	..	87	63	64
352	1927-28	28-1-28	"	3.1	7.9	0.5	11.2	19	180	5.20	12.07	7.9	87.9	8.3	694	..	..	..	..	8.1	15.0	16.8	11.0	7.4	9.9	4	0.7	11.8	81	65	54
482	1928-29	22-2-29	"	3.3	6.7	0.3	10.1	85	180	5.37	12.07	8.0	80.7	9.9	646	..	..	..	..	8.0	16.2	18.1	12.2	8.6	9.4	6	0.8	11.6	84	68	71
693	1929-30	13-3-30	"	2.4	7.9	0.3	10.4	55	183	4.95	12.07	7.9	79.3	8.0	626	8.1	217.6	4.4	1,762	8.0	15.4	21.4	18.7	9.3	11.8	5	1.1	11.7	85	65	67
948/1	1930-31	6-1-31	"	3.7	9.5	0.6	13.4	53	180	4.76	12.07	8.3	77.0	5.6	639	8.4	224.0	3.3	1,882	8.7	14.2	14.3	19.0	8.6	11.3	4	0.5	11.5	81	68	69
948/2	"	"	"	3.6	10.4	0.6	14.1	53	180	4.76	12.07	7.9	92.1	6.0	728	8.1	249.2	3.4	2,019	8.1	17.5	15.9	10.5	8.7	11.4	4	0.7	11.6	81	68	69
948/1	1930-31	6-1-31	8C	..	..	..	..	80	190	4.88	12.63	8.1	98.7	4.7	799	8.4	239.6	3.5	2,013	8.4	17.5	18.6	14.5	9.2	9.8	4	1.0	12.2	80	69	70
948/2	"	"	"	..	..	..	..	107	190	4.88	12.63	8.2	98.9	7.5	811	8.5	234.0	3.8	1,989	8.5	17.9	16.2	13.0	8.4	10.4	4	1.0	12.2	80	69	69
22	1924-25	6-5-25	8D	..	..	..	..	15	189	4.90	13.58	7.8	123.2	8.3	961	..	..	..	..	..	22.7	11.8	5.6	6.2	15.9	0	0	..	90	63	76
22	1924-25	5-5-25	10	..	..	..	..	20	188	5.65	13.58	9.2	71.9	8.1	661	..	..	..	..	..	14.3	18.6	15.8	4.9	20.5	6	0.1	..	91	65	76
227	1926-27	2-5-27	"	..	..	..	..	40	169	5.30	13.58	10.1	42.5	11.1	429	..	..	..	..	..	10.5	21.1	15.0	7.3	13.0	8	0.6	..	88	65	64
352	1927-28	28-1-28	"	..	..	..	..	90	167	6.47	13.58	9.9	51.9	10.6	514	..	..	..	..	10.1	11.2	17.1	10.5	6.5	13.5	6	0.7	13.2	80	64	53

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

III. FIBRE PARTICULARS. SERVANTS OF INDIA SOCIETY'S

BRANCH LIBRARY

BOMBAY

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.2	0.3	1.4	0.3	0.7	0.3	0.2
3	1.5	1.6	2.8	2.3	3.3	3.1	2.4
4	4.2	4.4	7.6	7.0	6.8	10.5	6.2
5	12.5	12.4	20.7	19.2	15.8	30.0	18.2
6	32.2	32.5	40.1	42.3	31.0	36.0	36.1
7	35.9	33.7	21.5	23.3	27.3	15.4	25.7
8	11.0	11.8	5.2	4.9	12.0	4.5	8.2
9	2.5	3.0	0.7	0.7	3.1	0.2	2.6
10	..	0.3	..	..	..	..	0.4
2. Fibre-Length (inch):—							
(a) By Balls Sorter	0.80	0.80	0.73	0.74	0.77	0.70	0.76
(b) By Baer Sorter	0.78	0.80	0.73	0.76	0.79	0.70	0.76
3. Fibre-Weight per inch (millionth of an ounce)							
	0.211	0.210	0.240	0.244	0.225	0.210	0.196
4. Fibre-Strength (oz.):—							
(a) By Balls Tester .. ..	..	..	0.181	0.173	0.180	0.167	0.153
(b) By O'Neill Tester .. ..	..	..	0.176	0.176	0.153	0.175	0.168
5. Fibre-Strength per unit fibre-weight per inch							
	..	..	0.74	0.72	0.74	0.81	0.82
6. Fibre-Rigidity (millionth of an ounce, square-inch)							
	..	..	0.280	0.376	0.257	0.392	0.306
7. Ribbon-Width (thousandth of an inch)							
	0.70	0.69	0.71	0.78	0.68	0.68	0.73
8. Convolutions per inch							
	96	96	72	70	71	78	79

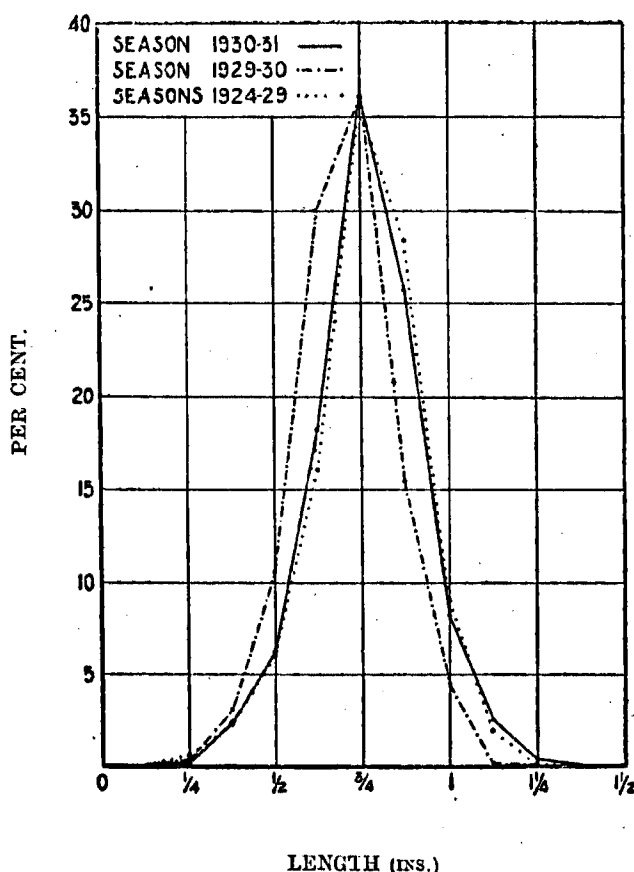


FIG. 10.—Sorter Diagrams for Cawnpore K. 22.

IV. SPINNING TESTS.

1. *Treatment*:—1924-25 and 1927-28 cottons: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1925-26 and 1926-27 cottons were passed direct through the Crighton (once only), the 1928-29 cotton was passed twice only through the Scutcher, and the 1929-30 and 1930-31 cottons were passed only once through the Crighton; otherwise the treatment of these cottons was the same as for the 1924-25 and 1927-28 cottons.
2. *Spinning Master's Report*:—
 - 1924-25 cotton: badly stained, leafy, and a trifle seedy; gave off an unusual amount of fly in the blow-room.
 - 1925-26 cotton: a little leafy; badly stained.
 - 1926-27 cotton: creamy-white to whitish; very clean; contains just a trace of cut seed and very small undeveloped seeds.
 - 1927-28 cotton: white to creamy-white; very clean; well ginned, but contains a little too many ginned and unginned seeds (0.43 per cent.); a trifle harsh to feel; a very good sample of its class.
 - 1928-29 cotton: creamy-white; clean; slightly harsh in feel; well-ginned.
 - 1929-30 cotton: clean; creamy-white; has a nice softish feel for this class; well-ginned.
 - 1930-31 cotton: dull creamy-white; clean; fairly bright; it is stained; fairly well-ginned.
3. *Spinning Test Details and Results*:—See Table 10, page 61.
 - Card Production for Sample No. 79:—12.5 lb. per hour.
 - Ring Frame Production for 10's, Sample No. 79:—19.29 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—With few exceptions, the fibre-properties of this cotton do not vary much with the season. The fibre-length is low in 1926-27 and, lowest of all, in 1929-30. The fibre-weight per inch is high in 1926-27 and 1927-28. The fibre-rigidity and the ribbon-width are both high in 1927-28 and low in 1928-29. The convolutions are comparatively fewer since 1926-27.

(ii) *Waste*.—This is a moderately clean cotton and except in 1924-25 has generally given about 5—6 per cent. blow-room loss. The card-room loss is rather more variable and higher than usual in 1925-26 and 1930-31.

(iii) *Breakages*.—Yarn breakages in the ring frame were comparatively numerous in all counts of 1924-25 and 1925-26 cottons and, with the exception of 1928-29, in 12's and 14's of other seasons.

(iv) *Yarns*.—The 12's yarns of this cotton are either even to fairly even or fairly even, but the 1924-25 yarns are inferior. The yarns are generally free from nep, though in 1925-26, they were rather neppy. The yarn-strength results are decidedly good in 1928-29, poor in the following season and much the same in the other five seasons.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1924-25	..	12's.
1925-26	..	12's.
1926-27	..	12's.
1927-28	..	12's.
1928-29	..	14's.
1929-30	..	11's.
1930-31	..	12's.

TABLE 10.—SPINNING TEST RESULTS FOR CAWNPORE K. 22.

HANK (1930-31).

Draw-frame..	0.17
Slubber ..	0.67
Inter ..	1.31
Rover ..	2.64

TRAVELLER COUNTS.

10 ^s ..	5
12 ^s ..	3
14 ^s ..	1

SPINDLE SPEED (1930-31).

10 ^a ..	6,800 r.p.m.
10 ^b ..	6,985 r.p.m.
14 ^a ..	7,550 r.p.m.
14 ^b ..	8,400 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS. *				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.		
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Weight Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Weight Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.		Extension (%).	Extension Irregularity (%)	Evenness Class.				Neps per yard.	Turns per inch Actual.
70	1924-25	7-12-25	10A	8.4	7.7	0.4	15.0	35	211	5.27	12.63	9.5	117.2	8.6	1,113	..	..	..	..	..	19.7	13.2	5.0	7.3	10.7	5	1.7	..	76	75	54
129	1925-26	21-5-26	..	6.3	10.4	0.8	16.7	25	105	5.05	12.63	9.7	125.6	6.3	1,218	..	..	..	..	..	19.0	12.1	2.7	5.7	15.3	3	4.5	..	92	62	62
228	1926-27	4-5-27	..	4.0	6.9	0.4	10.0	5	198	5.38	12.63	9.7	107.1	4.3	1,039	..	..	..	..	..	16.5	14.3	7.5	8.7	7.6	4	1.0	..	88	67	65
351	1927-28	27-1-28	..	6.4	7.3	0.4	13.6	10	106	4.71	12.63	10.0	99.9	6.9	990	10.4	14.5	12.6	5.2	7.5	8.7	3	1.2	12.3	81	68	61
461	1928-29	16-1-29	..	5.9	7.9	0.2	13.5	5	192	4.35	12.63	10.5	118.8	4.4	1,247	10.4	18.0	10.0	2.7	7.8	6.6	3	1.6	12.3	83	68	71
648	1929-30	17-1-30	..	4.2	8.5	0.4	14.5	15	194	4.18	12.63	9.0	92.7	7.0	918	10.1	105.2	3.7	1,971	10.4	14.0	14.4	7.7	7.5	11.1	4	2.7	12.2	82	59	65	
946/1	1930-31	2-1-31	..	5.6	9.1	0.5	14.6	10	193	4.10	12.63	9.8	122.9	5.5	1,204	10.1	236.4	3.7	2,368	10.3	18.0	11.7	5.0	8.2	8.8	3	2.2	12.1	81	70	63	
946/2	"	"	..	5.0		0.5	13.9	0	198	4.00	12.63	10.0	127.9	5.4	1,279	10.2	250.0	3.0	2,550	10.5	17.1	11.7	2.0	8.8	7.2	3	1.7	12.2	81	70	70	
648	1929-30	17-1-30	10B	..	..	..	..	25	194	4.18	13.58	10.0	120.8	5.6	1,208	10.2	217.4	2.8	2,217	10.4	16.7	14.0	9.7	7.7	8.8	4	2.1	13.0	82	62	68
946/1	1930-31	2-1-31	..	..	..	..	..	0	199	4.18	13.58	9.9	134.6	4.4	1,332	10.0	251.2	2.9	2,542	10.3	18.7	11.5	4.0	8.7	7.6	3	2.0	13.2	83	68	69
946/2	"	"	..	..	..	..	..	10	199	4.00	13.58	10.2	142.8	3.6	1,457	10.3	260.8	3.1	2,686	10.6	18.6	11.2	3.5	8.4	5.3	3	1.5	13.1	83	68	69
70	1924-25	7-12-25	12A	..	..	..	..	35	193	6.35	13.02	11.7	84.0	12.5	983	..	..	..	..	..	15.2	14.3	6.5	6.3	10.7	5	1.7	..	70	74	57
70	1924-25	8-12-25	12B	..	..	..	..	50	177	6.43	14.08	11.6	96.3	9.5	1,117	..	..	..	..	..	17.0	9.7	3.5	6.9	10.4	6	1.7	..	74	73	55
129	1925-26	21-5-26	..	..	..	..	..	50	184	7.39	14.08	11.6	109.0	7.9	1,204	..	..	..	..	..	17.1	10.3	1.7	5.2	15.3	4	5.2	..	91	62	61
228	1926-27	4-5-27	..	..	..	..	..	25	184	6.54	14.08	11.9	93.6	5.6	1,114	..	..	..	..	..	13.9	14.0	5.7	8.6	7.5	5	1.1	..	89	65	66
351	1927-28	27-1-28	36	188	5.49	14.08	11.7	94.8	7.0	1,109	12.0	14.4	14.7	8.7	8.1	8.1	4	1.9	14.2	80	67	65
461	1928-29	16-1-29	0	190	5.11	14.66	12.2	111.5	5.0	1,360	12.3	10.3	10.2	1.7	8.0	8.1	4	1.2	14.2	82	69	70
648	1929-30	17-1-30	..	..	..	..	..	36	196	5.05	14.68	12.0	79.9	7.9	959	12.6	145.4	4.3	1,832	12.3	13.0	11.8	4.7	7.2	9.7	5	1.8	14.0	81	64	67
946/1	1930-31	2-1-31	14A	..	..	..	..	53	180	5.86	15.08	14.0	68.4	8.0	930	14.2	137.0	4.3	1,945	14.2	10.9	14.1	8.5	7.2	10.1	5	3.0	14.7	83	69	68
946/2	"	"	..	..	..	..	..	27	180	5.56	15.08	14.1	77.3	6.8	1,090	14.2	147.4	2.5	2,093	14.3	11.6	15.2	10.0	7.5	11.1	5	2.2	14.6	85	69	68
228	1926-27	4-5-27	14B	..	..	..	..	10	185	7.05	15.97	13.9	73.6	7.1	1,023	..	..	..	..	..	11.3	9.9	2.7	8.2	7.1	5	1.2	15.5	83	69	67
351	1927-28	27-1-28	33	184	6.46	15.97	14.0	68.9	7.0	965	14.5	10.7	15.2	9.0	7.1	8.0	6	2.0	15.5	82	69	66
461	1928-29	16-1-29	10	182	5.80	15.97	14.1	95.4	5.7	1,345	14.3	13.7	11.3	2.7	7.4	6.7	4	1.8	15.5	83	68	66
648	1929-30	18-1-30	..	..	..	..	..	40	182	5.88	15.97	14.0	61.0	8.1	854	14.0	123.8	3.4	1,775	14.4	10.5	16.2	6.5	6.7	10.1	5	2.2	15.4	82	65	66
946/1	1930-31	3-1-31	..	..	..	..	..	27	196	5.66	15.97	14.4	72.1	6.7	1,038	14.6	139.0	4.2	2,029	14.9	11.2	13.0	5.5	7.1	9.0	5	2.0	15.5	81	71	68
946/2	"	"	..	..	..	..	..	40	196	5.56	15.97	14.0	88.0	5.5	1,232	14.5	150.6	4.2	2,184	14.2	12.5	10.9	2.0	7.5	9.6	5	2.2	15.6	81	71	70

11.—BUNDELKHAND J. N. 1.

Seasons ..	}	1924-25 (Sample No. 78).
		1925-26 (Sample No. 113).
		1926-27 (Sample No. 229).
		1927-28 (Sample No. 350).
		1928-29 (Sample No. 456).
		1929-30 (Sample No. 690).
		1930-31 (Sample No. 979).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—Probably *Gossypium neglectum Malvense* (Gammie).
- (ii) *History* :—A pure line selection obtained from a survey of United Provinces Bundelkhand indigenous (Bengals) cottons; first issued on a field scale in 1920. (*Reference*—Pusa Bulletin No. 123.)
- (iii) *District of growth* :—Cawnpore. The particular samples used in these tests have been grown on the Government Farm, Cawnpore.
- (iv) *Growing period* :—Sown early in June, and picked from the third week in September to the end of November.
- (v) *Soil* :—Alluvium of the Gangetic Plain.
- (vi) *Rainfall* :—Variable—about 30 inches annually.
- (vii) *Temperature* :—Max. 103°F., Min. 83°F. June.
 ,, 75°F., ,, 48°F. December.
- (viii) *Plant particulars* :—
- (a) Bolls per plant :—Information not available (Spacing 18" × 18").
- (b) Seeds per boll :—Information not available.
- (c) Weight of seed :—40 milligrammes.
- (d) Weight of lint per seed :—24 milligrammes.
- (e) Ginning percentage : 36.
- (ix) *Yield of seed-cotton* :—480 lbs. per acre (Cawnpore Farm, 1930-31).
- (x) *Area under cultivation* :—

1923-24	..	920 acres.
1924-25	..	2,020 "
1925-26	..	1,977 "
1926-27	..	1,020 "
1927-28	..	500 "
1928-29	..	400 "

It is estimated that in 1929-30 there were not more than 200 to 300 acres of this variety under cultivation. No seed was distributed in 1930-31 by the Department.

II. GRADER'S REPORT.

	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under.	..	..	Oomra.	Oomra.	Oomra.	Broach.	Oomra.
Class	Fine Punjab-American.	Fully Good to Fine Punjab-American.	Superfine.	Fine.	Fine.	Fine.	Fully Good.
Colour .. ..	..	..	White.	White.	White.	White.	White.
Staple Length ..	11/16-13/16 in.	1/2-5/8 inch.	3/4 inch.	13/16 inch.	3/4 inch.	7/8 inch.	3/4 inch.
Staple Strength..	Good.	..	Fair.	Good.	Good.	Fair.	Fair.
Regularity ..	..	..	Fair.	Good.	Good.	Fair.	Fair.
Value above or below contract rate.	..	..	Rs. 30 on.	Rs. 35 on.	Rs. 35 on.	Pass.	Pass.
Basis .. ..	..	..	Rs. 282.	Rs. 345.	Rs. 330.	Rs. 260.	Rs. 165.
Date of Valuation.	..	..	2-4-27.	20-1-28.	2-1-29.	12-3-30.	5-2-31.
Remarks .. ..	..	More like Bengal cotton.	..	..	Rough cotton.	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—							
Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.3	0.8	0.3	0.4	0.4	0.5	0.6
3	2.2	2.3	1.8	2.8	2.1	2.0	2.6
4	5.3	4.9	4.7	5.8	5.2	6.5	6.3
5	14.8	13.7	13.5	17.1	15.5	18.2	17.0
6	32.4	36.1	35.2	40.7	36.9	37.9	37.9
7	33.0	33.0	33.1	27.0	28.3	24.7	26.0
8	10.7	8.4	9.6	5.9	9.3	7.7	8.1
9	1.3	0.8	1.8	0.3	2.1	2.5	1.5
10	..	..	..	..	0.2	..	..
2. Fibre-Length (inch):							
(a) By Balls Sorter	0.78	0.77	0.78	0.75	0.77	0.76	0.76
(b) By Baer Sorter	0.78	0.78	0.77	0.73	0.76	0.75	0.77
3. Fibre-weight per inch (millionth of an ounce)							
	0.243	0.237	0.242	0.226	0.236	0.229	0.218
4. Fibre-Strength (oz.)—							
(a) By Balls Tester .. ..	..	..	0.183	0.198	0.212	0.180	0.172
(b) By O'Neill Tester .. ..	..	..	0.183	0.201	0.196	0.191	0.178
5. Fibre-Strength per unit fibre-weight per inch							
	..	..	0.76	0.88	0.86	0.81	0.80
6. Fibre-Rigidity (millionth of an ounce, square-inch)							
	..	..	0.216	0.245	0.280	0.300	0.315
7. Ribbon-Width (thousandth of an inch)							
	0.70	0.63	0.71	0.71	0.72	0.71	0.76
8. Convolutions per inch							
	96	91	65	74	85	81	82

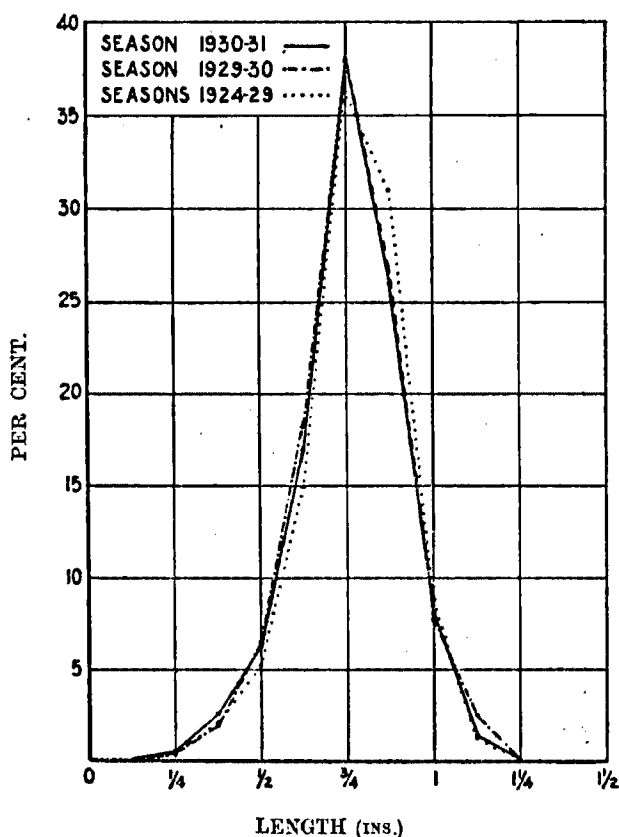


FIG. 11.—Sorter Diagrams for Bundelkhand J. N. 1—(Bengals).

IV. SPINNING TESTS.

1. *Treatment* :—1924-25, 1927-28, 1929-30 and 1930-31 cottons: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1925-26 cotton was passed direct through the Crighton (once only), the 1926-27 cotton was passed only once through the Crighton and twice through the Scutcher, and the 1928-29 cotton was passed twice through the Crighton and twice through the Scutcher; otherwise these cottons received the same treatment as the 1924-25 cotton.
2. *Spinning Master's Report* :—
 - 1924-25 cotton: clean and white; has a harsh feel.
 - 1925-26 cotton: a fairly clean cotton.
 - 1926-27 cotton: creamy-white and stained; free from leaf but very seedy indeed (2.2 per cent.), about half the seed being cut seed.
 - 1927-28 cotton: creamy-white, clean; has a fairly soft, but bodied feel; well-ginned, except for a little knot, but contains too much seed (0.43 per cent.)
 - 1928-29 cotton: white; bright; very clean; has a slightly harsh feel; well-ginned; a very good sample of its class.
 - 1929-30 cotton: creamy-white; clean; bright; very well-ginned; has a slightly harsh feel; a very good sample of its class.
 - 1930-31 cotton: white to creamy-white; fairly clean; shows an occasional stain; it has a slightly harsh but good feel and is well-ginned. Card web is clear and even; sliver clean and ten flat strips weigh 12.3 grams.
3. *Spinning Test Results* :—See Table 11, page 65.
 - Card Production for Sample No. 78 :—15.7 lb. per hour.
 - Ring Frame Production for 10's, Sample No. 78 :—15.11 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The more important fibre-properties of this cotton are very nearly the same in the successive seasons. The fibre-strength and the fibre-strength per unit fibre-weight per inch are both high in the two seasons 1927-29. The fibre-rigidity shows a steady increase. The ribbon-width is low in 1925-26, and high in 1930-31. The convolutions are comparatively less numerous in 1926-27 and 1927-28.

(ii) *Waste*.—This cotton is moderately clean and gives about 6 per cent. blow-room loss.

(iii) *Breakages*.—Excepting 1924-25, yarn-breakages in the ring frame are quite few in all counts up to 12's; but they are numerous in 14's counts in most of the seasons.

(iv) *Yarns*.—The yarns of this cotton are generally even in 10's counts, even to fairly even in 12's, and are distinguished by being practically free from neppiness. The yarn-strength results vary to some extent with the season, being better than usual in 1926-27 and 1927-28.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons :—

1924-25	..	12's.
1925-26	..	12's.
1926-27	..	14's.
1927-28	..	14's.
1928-29	..	13's.
1929-30	..	12's.
1930-31	..	12's.

TABLE 11.—SPINNING TEST RESULTS FOR BUNDELKHAND J. N. 1.

HANK (1930-31).
 Draw-frame 0.17
 Slubber ,, 0.66
 Inter ,, 1.18
 Rover ,, 2.53

TRAVELLER COUNTS.
 8^s 7
 10^s 5
 12^s 3
 14^s 1

SPINDLE SPEED (1930-31).
 10^A .. 6,800 r. p. m.
 12^A .. 6,800 r. p. m.
 14^A .. 6,800 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Tasting Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)					Evenness Class.	Neps per yard	Turns per inch Actual.
78	1924-25	5-12-25	8	5.7	7.1	0.8	18.1	75	212	4.43	11.31	7.8	138.1	11.8	1077	..	..	..	..	..	22.1	11.5	0	6.4	12.9	3	0.9	..	76	73	64
113	1925-26	1-4-26	10A	5.7	7.8	0.7	13.7	10	183	5.88	12.63	9.8	101.7	10.4	997	..	..	..	..	..	17.4	17.4	11.5	7.3	14.4	3	1.7	..	85	69	63
229	1926-27	5-5-27	..	7.1	7.2	0.3	14.2	5	206	4.88	12.63	9.9	118.5	6.7	1,173	9.2	17.9	14.0	5.5	9.2	8.6	3	0.6	12.4	90	66	70
350	1927-28	25-1-28	..	6.9	8.7	0.3	15.3	0	198	4.59	12.63	10.5	108.5	5.8	1,139	10.5	17.8	11.4	6.2	6.9	8.7	3	1.0	12.3	80	66	44
456	1928-29	4-1-29	..	5.0	7.0	0.3	12.0	10	197	4.55	12.63	10.4	107.1	6.4	1,114	10.9	15.3	14.3	6.0	8.4	8.8	3	0.8	12.2	83	63	70
600	1929-30	11-3-30	..	5.7	8.2	0.3	13.8	15	198	4.88	12.63	10.1	91.7	7.8	926	10.2	215.0	2.9	2193	10.4	14.8	14.8	9.5	8.6	8.8	3	1.9	12.1	83	67	67	
979/1	1930-31	12-2-31	..	6.9	7.2	0.5	14.0	20	196	4.88	12.63	10.1	104.4	5.0	1,054	10.8	214.8	2.5	2212	10.7	14.9	14.8	9.5	7.5	10.7	3	1.0	12.0	81	68	69	
979/2	..	..	..	6.0	7.9	0.4	14.5	10	196	4.88	12.63	10.1	107.3	5.2	1,084	10.2	210.4	2.4	2146	10.7	14.1	18.0	12.5	9.1	12.2	3	0.7	12.1	81	68	68
78	1924-25	2-12-25	10B	..	..	..	..	75	192	5.80	13.58	10.4	115.7	9.8	1,203	..	..	..	..	..	18.8	10.7	3.0	10.7	13.4	3	0.6	..	80	77	61
113	1925-26	1-4-26	..	..	..	..	..	5	176	5.88	13.58	9.7	127.3	6.3	1,235	..	..	..	..	..	20.0	13.1	6.2	7.7	11.3	3	1.7	..	85	62	64
600	1929-30	11-3-30	..	..	..	..	..	85	200	4.88	13.58	10.0	114.6	7.6	1,146	10.1	232.4	2.8	2347	10.2	17.3	12.5	4.7	6.1	7.2	3	1.9	13.1	85	67	68
979/1	1930-31	12-2-31	12A	..	..	..	..	32	178	5.88	13.92	12.3	71.5	6.6	879	12.5	164.2	4.4	2052	12.6	12.1	15.8	8.0	7.1	10.8	4	0.7	13.2	81	69	68
979/2	..	..	..	..	..	..	..	8	178	5.88	13.92	12.3	74.6	8.2	917	12.4	168.4	2.2	2088	12.9	11.0	18.4	14.5	8.3	13.1	4	0.7	13.4	81	69	69
78	1924-25	4-12-25	12 B	..	..	..	..	85	182	6.73	14.68	12.1	86.6	12.0	1,048	..	..	..	..	..	14.6	10.5	3.2	5.5	15.9	5	0.7	..	77	74	60
113	1925-26	1-4-26	..	..	..	..	..	0	181	7.14	14.68	11.8	86.6	7.5	1,022	..	..	..	..	..	14.7	14.2	8.5	6.5	11.3	4	2.2	..	85	66	64
229	1926-27	6-5-27	0	186	5.85	14.68	11.7	112.6	6.9	1,917	10.9	16.9	11.8	4.5	9.2	7.5	4	0.7	14.2	88	67	..
350	1927-28	26-1-28	8	190	5.42	14.68	12.6	96.5	5.0	1,216	12.6	14.9	13.4	3.5	7.1	9.2	4	2.1	14.2	81	69	40
456	1928-29	4-1-29	20	194	5.41	14.68	12.4	95.2	7.7	1,180	12.9	13.8	12.5	6.2	8.4	7.3	4	1.6	14.2	83	65	72
600	1929-30	12-3-30	..	..	..	..	..	24	188	5.68	14.68	11.6	90.8	7.5	1,053	12.1	184.6	2.4	2234	12.0	14.1	15.0	7.2	8.0	7.2	5	1.7	14.2	85	65	68
979/1	1930-31	12-2-31	14A	..	..	..	..	80	164	6.76	15.08	14.3	54.1	10.6	774	14.5	125.6	4.2	1821	15.3	8.8	21.3	16.0	6.4	16.9	5	1.0	14.5	82	69	68
979/2	..	..	..	..	..	..	..	27	164	6.91	15.08	13.8	65.0	11.3	897	14.2	129.8	3.4	1843	14.7	9.0	20.1	14.5	7.8	11.3	5	1.0	14.5	82	69	69
229	1926-27	6-5-27	14 B	0	180	6.86	15.07	13.7	91.8	8.6	1,258	13.4	12.3	15.8	9.0	8.5	8.8	4	1.1	15.4	89	64	80
350	1927-28	26-1-28	12	180	6.18	15.07	14.2	81.1	5.9	1,152	14.3	13.5	12.3	5.0	7.2	8.4	5	2.4	15.5	82	66	55
456	1928-29	4-1-29	46	186	6.25	15.07	14.4	75.1	8.1	1,081	14.6	12.3	13.8	7.5	8.1	8.7	5	1.3	15.4	82	68	73
600	1929-30	12-3-30	..	..	..	..	..	60	188	6.60	15.07	13.4	71.3	9.1	955	13.8	160.4	2.8	2213	13.7	11.9	15.3	7.0	7.8	8.1	5	2.2	15.5	84	66	66

* Diameter of ring frame front roller— $\frac{7}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

12.—CAWNPORE-AMERICAN C. A. 9.

Seasons ..	{	1924-25 (Sample No. 77).
		1925-26 (Sample No. 112).
		1926-27 (Sample No. 231).
		1927-28 (Sample No. 349).
		1928-29 (Sample No. 457).
		1929-30 (Sample No. 689).
		1930-31 (Sample No. 980).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A pure line selection from acclimatized Cawnpore-American cotton, first issued in 1917. (*Reference* :—Pusa Bulletins Nos. 88, 126.)
- (iii) *District of growth* :—Cawnpore. The particular samples used in these tests have been grown on the Government Farm, Cawnpore.
- (iv) *Growing period* :—Sown the third week in May, and picked from early October to early December.
- (v) *Soil* :—Alluvium of Gangetic plain.
- (vi) *Rainfall* :—Variable—about 30 inches annually.
- (vii) *Temperature* :—Max. 103°F., Min. 83°F.-June.
 „ 75°F., „ 48°F.-December.
- (viii) *Plant particulars* :—
- (a) Bolls per plant :—Not determined (spacing 24" × 24").
- (b) Seeds per boll :—Not determined.
- (c) Weight of seed :—75 milligrammes.
- (d) Weight of lint per seed :—34 milligrammes.
- (e) Ginning percentage : 31.
- (ix) *Yield of seed-cotton* :—628 lbs. per acre (Cawnpore Farm, 1930-31).
- (x) *Area under cultivation* :—

1923-24	..	359 acres.
1924-25	..	119 „
1925-26	..	412 „
1926-27	..	938 „
1927-28	..	1,100 „
1928-29	..	900 „

The area in 1921 was 8,500 acres but is now restricted owing to lack of irrigation facilities. It is estimated that in 1929-30 there were not more than 200 to 300 acres of this variety under cultivation. No seed was distributed in 1930-31 by the department.

II. GRADER'S REPORT.

	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30	Season 1930-31.
Contract valued under .. ..	..	..	Broach.	Broach.	Broach.	Broach.	Broach.
Class	Fine Punjab-American.	Fine Punjab-American.	Fine.	Fine.	Fine.	Fine.	Fine.
Colour .. ..	..	..	White.	Creamy.	Slightly creamy.	White.	White.
Staple Length ..	13/16 inch.	11/16-3/4 inch.	3/4-7/8 inch.	7/8 inch.	15/16-1 1/8 inch	Barely 1 1/8 inch.	15/16 inch.
Staple Strength ..	Good	Good.	Fair.	Good.	Fair.	Good.	Fair.
Regularity ..	..	..	Poor.	Good.	Poor.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	Rs. 25 on.	Rs. 30 on.	Rs. 50 on.	Rs. 70 on.	Rs. 30 on.
Basis .. ..	..	..	Rs. 280.	Rs. 370.	Rs. 365.	Rs. 260.	Rs. 200
Date of Valuation ..	..	..	2-4-27.	20-1-28.	2-1-29.	18-3-30	5-2-31.
Remarks.. ..	..	Strong silky cotton.	..	Silky.	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0	0.9	0.2	0.2	0.7	0.2	0.6
3	1.5	1.8	1.0	1.5	1.7	1.6	1.9
4	2.5	3.4	2.7	3.2	2.9	3.9	3.5
5	6.5	7.1	7.1	7.4	6.0	8.8	7.6
6	15.0	15.4	18.4	17.0	14.5	20.0	19.5
7	33.5	35.2	35.2	34.2	30.5	33.3	35.5
8	31.4	26.7	28.1	28.0	33.3	24.6	23.4
9	8.7	8.1	6.7	7.0	9.1	6.5	6.9
10	0.9	1.4	0.6	1.5	1.3	1.1	1.1

2. Fibre-Length (inch):—							
(a) By Balls Sorter ..	0.89	0.87	0.87	0.87	0.89	0.86	0.85
(b) By Baer Sorter ..	0.90	0.87	0.88	0.86	0.89	0.88	0.87
3. Fibre-Weight per inch (millionth of an ounce)							
	0.163	0.147	0.182	0.176	0.166	0.165	0.154
4. Fibre-Strength (oz.):—							
(a) By Balls Tester ..	0.163	0.141	0.167	0.145	0.160	0.163	0.137
(b) By O'Neill Tester ..	0.159	0.155	0.153	0.158	0.156	0.173	0.157
5. Fibre-Strength per unit fibre-weight per inch							
	0.99	1.01	0.88	0.86	0.95	1.02	0.95
6. Fibre-Rigidity (millionth of an ounce, square-inch)							
	0.164	0.171	0.185	0.170	0.239	0.294	0.225
7. Ribbon-Width (thousandth of an inch)							
	0.65	0.65	0.61	0.63	0.60	0.64	0.62
8. Convolutions per inch							
	144	114	119	105	127	108	124

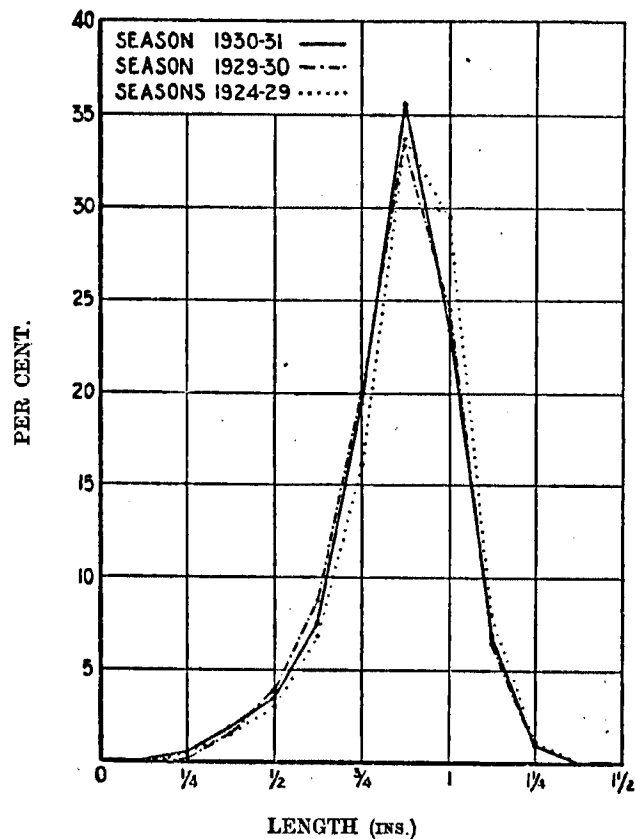


FIG. 12.—Sorter Diagrams for Cawnpore-American C. A. 9.

IV. SPINNING TESTS.

1. *Treatment*:—1924-25, 1927-28, 1928-29, 1929-30 and 1930-31 cottons: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1926-27 cotton was passed once only through the Crighton, and the 1925-26 cotton was passed direct through the Crighton (once only); otherwise these cottons received the same treatment as in the other seasons.
2. *Spinning Master's Report*:—
 - 1924-25 cotton: creamy-white; contains much fine leaf, and is stained.
 - 1925-26 cotton: bright and white; contains an excess of fine leaf and seeds.
 - 1926-27 cotton: creamy, with a silky feel; contains a little leaf and a little cut seed; is full of undeveloped seeds (1.88 per cent.), and has been nepped a little in ginning; card web neppy.
 - 1927-28 cotton: creamy; has a good soft feel; clean; well ginned, except for a little knot and string, but contains too much unginned seed; shed excessive fly and nep on the beam and rails of the ring frame.
 - 1928-29 cotton: creamy-white; bright; fairly clean; has a good silky feel; well-ginned, but contains far too many undeveloped seeds (1.3 per cent.).
 - 1929-30 cotton: creamy-white; clean; bright; has a good softish feel; the staple is fairly regular and of good strength; the lint is free of cut seed but is in a knotted condition and has subsequently resulted in a slightly cloudy card web. The web is also a trifle neppy due to the presence of a few undeveloped seeds in the cotton; a desirable and showy cotton.
 - 1930-31 cotton: white to creamy-white; fairly clean; bright; it has a good soft feel; well-ginned. The staple is fine, regular in length and strong. The card web is good; sliver clean and ten flat strips weigh 13.4 grams.
3. *Spinning Test Results*:—See Table 12, page 69.
 - Card Production for Sample 77: 11.8 lb. per hour.
 - Ring Frame Production for 40's, Sample 77:—2.45 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The fibre-length is very nearly the same in each season. The fibre-weight per inch is low in 1925-26. The fibre-strength does not vary much, but the fibre-strength per unit fibre-weight per inch is comparatively low in the two seasons 1926-28. The fibre-rigidity is about 80 per cent. higher in 1929-30 than in 1924-25. The convolutions are comparatively numerous in 1924-25 and few in 1927-28.

(ii) *Waste*.—This cotton usually gives about 7 per cent. blow-room loss, though the 1928-29 sample was a little more wasty. The card-room loss was a little higher than usual in 1925-26 and 1928-29.

(iii) *Breakages*.—Yarn-breakages in the ring frame are comparatively few in all seasons except 1929-30.

(iv) *Yarns*.—The yarns of this cotton do not vary much with the season as regards evenness being generally even to fairly even in 30's counts. The 1924-25 yarns are less neppy while the 1928-29 yarns are more neppy than in the other seasons. The yarn-strength results show some variation, being rather poor in 1924-25 and 1925-26 and best of all in 1928-29.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1924-25	..	28's.
1925-26	..	28's.
1926-27	..	34's.
1927-28	..	30's.
1928-29	..	40's.
1929-30	..	34's.
1930-31	..	37's.

TABLE 12.—SPINNING TEST RESULTS FOR CAWNPORE-AMERICAN C. A. 9.

HANK (1930-31).
 Draw-frame .. 0.20
 Slubber .. 0.86
 Inter .. 1.89
 Rover .. 4.90

TRAVELLER COUNTS.
 20° .. 3/0
 30° .. 7/0
 34° .. 9/0
 40° .. 12/0

SPINDLE SPEED (1930-31).
 20° B .. 9,200 r.p.m.
 30° .. 9,300 r.p.m.
 40° A .. 9,600 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count- Strength Product.	Counts Actual.	Work of Rapture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%)	Extension Irregularity (%).					Evenness Class.	Neps per yard.	Turns per inch Actual.
77	1924-25	23-11-25	20A	6.9	7.6	0.7	14.5	10	184	4.49	16.85	19.1	84.4	7.2	1,612	..	..	..	..	..	12.0	9.2	1.7	4.5	15.9	4	2.0	..	82	76	56
112	1925-26	7-4-26	..	6.6	9.4	0.5	15.8	17	182	4.00	16.85	19.0	83.5	6.0	1,587	..	..	..	..	..	11.6	10.3	2.7	5.7	10.4	3	3.1	..	84	64	66
231	1926-27	10-5-27	..	6.9	7.9	0.3	14.6	10	190	4.35	16.85	19.1	91.2	6.0	1,742	..	..	..	..	..	12.8	14.6	7.5	7.2	7.3	3	3.0	16.3	89	65	79
349	1927-28	24-1-28	..	6.7	8.6	0.3	15.0	7	193	4.25	16.85	19.9	76.6	5.7	1,524	..	..	..	..	..	10.4	16.1	8.7	5.4	10.5	3	3.2	16.2	82	67	68
457	1928-29	7-1-29	..	8.9	10.0	0.3	18.2	2	190	4.65	16.85	20.1	97.2	5.8	1,954	..	..	..	..	..	12.9	10.5	1.0	6.7	6.4	3	4.6	16.1	83	60	75
689	1929-30	10-3-30	..	4.7	8.3	0.3	13.3	17	186	4.39	16.85	19.5	94.7	5.3	1,847	19.8	130.2	3.0	2,578	13.3	11.6	2.0	6.8	9.1	3	2.9	16.1	82	64	66
980/1	1930-31	13-2-31	20B	7.2	8.1	0.5	15.1	10	196	4.44	17.98	20.2	103.2	3.2	2,085	20.1	136.8	2.8	2,790	13.9	10.4	1.0	7.1	8.4	2	3.2	17.5	81	68	68
980/2	6.9	7.9	0.4	14.6	0	196	4.44	17.98	20.1	100.7	3.8	2,024	20.2	137.0	5.5	2,767	14.1	7.8	0	7.2	5.2	2	2.2	17.3	81	68	66
77	1924-25	24-11-25	30	..	..	..	..	11	142	6.86	21.86	29.2	47.5	8.3	1,387	..	..	..	..	..	7.0	11.1	4.2	3.3	20.3	4	2.0	..	79	75	56
112	1925-26	7-4-26	..	..	..	..	..	3	141	6.21	21.86	29.3	46.9	6.6	1,374	..	..	..	..	..	7.4	11.1	2.2	5.1	11.8	5	2.9	..	84	64	64
231	1926-27	11-5-27	..	..	..	..	..	5	157	6.61	21.86	28.9	55.8	3.8	1,613	..	..	..	..	..	8.7	12.0	4.2	6.6	8.0	4	2.5	20.9	89	64	77
349	1927-28	24-1-28	..	..	..	..	..	7	158	6.20	21.86	30.5	47.0	7.1	1,434	..	..	..	..	..	7.5	12.8	4.5	5.1	8.9	5	3.9	21.1	81	68	65
457	1928-29	7-1-29	..	..	..	..	..	15	158	6.69	21.86	29.2	62.1	5.4	1,813	..	..	..	..	..	8.3	11.9	6.5	6.0	8.9	4	4.7	20.9	81	64	74
689	1929-30	10-3-30	25	156	6.56	21.86	29.3	57.5	5.8	1,685	29.7	86.4	2.1	2,566	8.5	12.8	3.0	6.0	8.5	4	3.5	20.8	84	64	65
980/1	1930-31	13-2-31	7	164	6.45	21.86	30.5	57.2	4.7	1,745	30.7	86.8	2.1	2,665	8.7	13.3	6.0	6.2	9.0	4	2.5	21.4	82	69	67
980/2	13	164	6.45	21.86	30.1	57.7	3.5	1,737	30.2	88.0	3.0	2,658	9.3	9.0	1.0	6.2	7.8	4	2.7	21.0	82	69	68
457	1928-29	8-1-29	34	..	..	..	..	14	147	7.61	23.20	33.5	49.9	5.9	1,672	..	..	..	..	..	6.7	13.2	6.0	5.5	10.6	6	5.3	22.2	84	64	73
689	1929-30	11-3-30	30	148	7.54	23.26	33.8	46.0	7.3	1,521	34.5	75.7	3.0	2,612	7.1	14.2	7.0	5.5	12.1	6	4.0	22.5	83	64	66
980/1	1930-31	14-2-31	40A	8	137	8.44	25.28	30.4	37.5	5.8	1,477	40.6	64.8	3.1	2,631	6.0	12.2	6.0	5.6	13.0	5	3.5	25.0	81	70	63
980/2	20	137	8.44	25.28	39.2	37.2	5.4	1,458	40.0	65.6	2.7	2,624	6.4	12.8	6.0	5.3	12.1	5	3.0	24.6	81	70	70
77	1924-25	25-11-25	40B	..	..	..	..	24	115	9.15	26.97	39.2	29.8	10.2	1,168	..	..	..	..	..	5.0	11.0	4.5	2.9	23.2	6	1.1	..	80	79	54
112	1925-26	8-4-26	..	..	..	..	..	8	115	8.44	26.97	40.2	30.0	8.1	1,206	..	..	..	..	..	5.0	13.7	8.0	3.8	19.1	5	3.0	..	84	64	64
231	1926-27	12-5-27	..	..	..	..	..	4	128	8.91	26.97	38.8	37.5	6.4	1,455	..	..	..	..	..	5.7	14.4	7.0	5.9	10.0	4	2.6	25.8	80	64	76
349	1927-28	25-1-28	..	..	..	..	..	13	132	8.31	26.97	40.0	33.8	7.1	1,344	..	..	..	..	..	5.5	14.6	6.2	4.4	13.6	7	3.4	25.8	82	70	61

* Diameter of ring frame front roller— $\frac{1}{2}$ inch. Diameter of rings— $1\frac{1}{2}$ inch.

13 (a).—VERUM 262. (NAGPUR).

Seasons	..	{	1926-27 (Sample No. 247).
			1927-28 (Sample No. 346).
			1928-29 (Sample No. 468).
			1929-30 (Sample No. 628).
			1930-31 (Sample No. 962).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum verum*.
- (ii) *History* :—A pure line strain isolated by selection in 1924, and known as strain No. 262.
- (iii) *District of growth* :—Central Provinces and Berar. The particular samples used in these tests have been grown at the Experimental Farm, Nagpur, C. P.
- (iv) *Growing Period* :—June to January.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—49 inches.
- (vii) *Temperature* :—Maximum temperatures : June—110° F., January—85° F.
- (viii) *Plant particulars* (average for 3 seasons 1928-1931) :—
- (a) Bolls per plant : 17 (spacing 18" × 8").
- (b) Seeds per boll : 27.
- (c) Weight of seed : 65 milligrammes.
- (d) Weight of lint per seed : 32 milligrammes.
- (e) Ginning percentage : 33 (In bulk field samples from 32 to 35 per cent).
- (ix) *Yield of seed cotton* :—From 300 to 1,000 lbs. per acre according to the soil conditions.
- (x) *Area under cultivation* :—About 5,000 acres in 1928-29.
 „ 35,000 acres in 1929-30.
 „ 1,50,000 acres in 1930-31 (Total area)

II. GRADER'S REPORT.

	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under ..	Berar.	Broach.	Broach.	Berar.	Broach.
Class	Fine.	Superfine.	Fine.	Extra superfine.	Fine.
Colour	White.	White.	White.	White.	White.
Staple Length	¾ inch.	⅞ inch.	⅞ inch.	⅞ inch.	¾ inch.
Staple Strength	Fair.	Good.	Good.	Good.	Fair.
Regularity	Fair.	Good.	Good.	Good.	Poor.
Value above or below con- tract rate	Rs. 35 on.	Rs. 70 on.	Rs. 35 on.	Rs. 80 on.	Rs. 20 on.
Basis .. .. .	..	Rs. 370.	Rs. 355.	Rs. 270.	Rs. 200.
Date of Valuation ..	17-5-27.	20-1-28.	7-2-29.	18-12-29.	5-2-31.
Remarks	For staple.	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.				
	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.
2	..	0.2	..	0.4	0.3
3	1.7	1.4	1.5	1.8	1.7
4	3.3	3.3	3.8	3.8	3.9
5	8.1	7.4	7.5	10.2	9.4
6	22.6	15.7	19.5	28.1	25.6
7	41.0	32.6	34.5	35.3	37.1
8	18.9	28.5	24.8	16.0	16.4
9	4.4	9.1	6.8	4.2	4.8
10	..	1.8	1.6	0.2	0.7
11	..	..	..	..	0.1

2. Fibre-Length (inch):—					
(a) By Balls Sorter	0.84	0.88	0.86	0.82	0.83
(b) By Bear Sorter	0.84	0.87	0.85	0.80	0.82
3. Fibre-Weight per inch (millionth of an ounce)					
	0.185	0.216	0.215	0.166	0.186
4. Fibre-Strength (oz.):—					
(a) By Balls Tester	0.171	0.198	0.206	0.170	0.193
(b) By O'Neill Tester .. ..	..	..	0.192	0.181	0.199
5. Fibre-Strength per unit fibre-weight per inch					
	0.92	0.92	0.93	1.06	1.05
6. Fibre-Rigidity (millionth of an ounce, square inch)					
	..	0.209	0.193	0.218	0.180
7. Ribbon-Width (thousandth of an inch)					
	..	..	0.62	0.64	0.61
8. Convolutions per inch					
	..	..	72	92	82

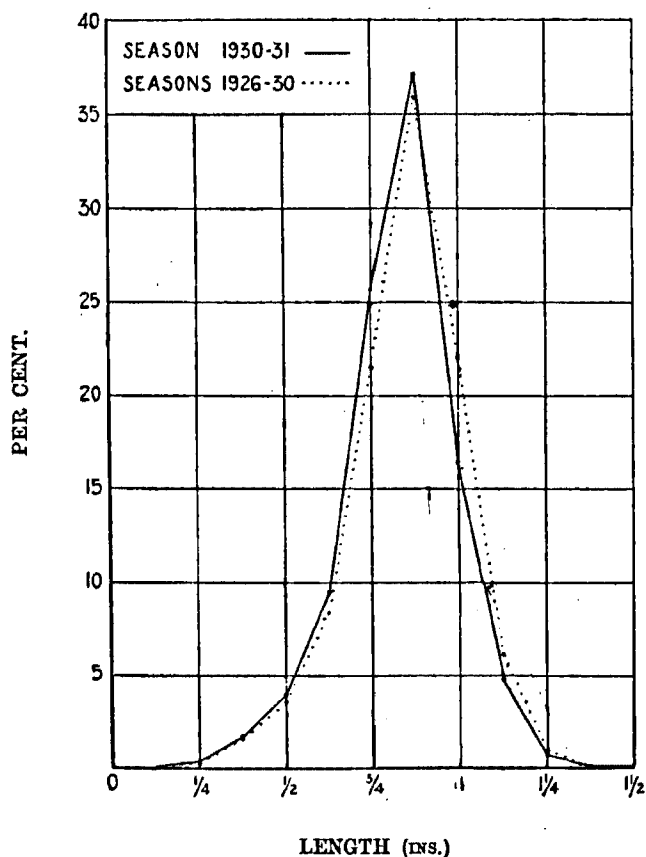


FIG. 13 (a)—Sorter Diagrams for Verum 262 (Nagpur).

IV. SPINNING TESTS.

1. *Treatment*.—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1928-29 cotton was passed twice through the Crighton; otherwise its treatment was the same as for the other cottons.
2. *Spinning Master's Report*.—
 - 1926-27 cotton: white; bright; silky feel, very seedy with 2.15 per cent. cut seed; very clean (*i.e.*, free of leaf); a few small undeveloped seeds present.
 - 1927-28 cotton: white to creamy-white; bright; very clean; has a full bodied feel; staple is strong; a very fine cotton.
 - 1928-29 cotton: white; a little leafy; slightly stained; contains too many cut and partly ginned seeds (0.82 per cent.).
 - 1929-30 cotton: white; bright; very clean; well-ginned except for full clean seeds (0.30 per cent.); has a good bodied feel with plenty of cling.
 - 1930-31 cotton: white; very clean; bright; it has a good bodied feel; very well-ginned.
3. *Spinning Test Details and Results*.—See Table 13 (a), page 73.

V. REMARKS.

Fibre.—The fibre-length is much the same during the first three seasons, but shows a drop of 5 per cent. in 1929-30 and 1930-31. The fibre-weight per inch is also less in 1929-30 and 1930-31 than in the two previous seasons. The fibre-strength shows seasonal variation, the maximum value in 1928-29 being some 16 per cent. greater than the minimum value in 1926-27. The fibre-strength per unit fibre-weight per inch is practically the same in the different seasons when due allowance is made for the change in the method of determining fibre-weight. The rigidity and ribbon-width do not show much variation but the convolutions are some 30 per cent. more numerous in 1929-30 than in the preceding season.

Waste.—With the exception of the 1926-27 and 1928-29 samples the cotton has been delivered in a clean condition. This year particularly the blow-room loss is very small. The card room loss was rather high in 1926-27 and 1928-29.

Breakages.—Yarn breakages in the ring frame are generally few in all cases except 20's and 26's of 1929-30 and 26's, spun with 20·23 turns per inch, of 1930-31.

Yarns.—This cotton usually gives yarns which are even in 20's and fairly even in 26's. The yarns are fairly free from neppiness. The yarn-strength results show some variation, the 1929-30 cotton giving the weakest yarns.

Conclusions.—During the first three seasons, this cotton did not exhibit much variation. But in 1929-30 there was a distinct falling off in its fibre-length and spinning performance. The fibre-length remains practically the same in 1930-31, but the yarn-strength results have improved considerably. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1926-27	..	24's
1927-28	..	26's
1928-29	..	26's
1929-30	..	21's
1930-31	..	26's

TABLE 13 (a).—SPINNING TEST RESULTS FOR VERUM 262 (NAGPUR).

HANK (1930-31).

Draw-frame .. 0.17
 Slubber .. 0.76
 Inter .. 1.63
 Rover .. 4.11

TRAVELLER COUNTS.

20^s .. 3/0
 26^s .. 5/0

SPINDLE SPEED (1930-31).

20A .. 9,400 r.p.m.
 20B .. 9,650 r.p.m.
 26 .. 8,900 r.p.m.

1 Sample No.	2 Season.	3 Date of Spinning.	4 Counts Nominal.	5-8 WASTE PERCENTAGES.				9-12 RING FRAME PARTICULARS.*				13-29 YARN TEST RESULTS.														30 TEMPERATURE ° F.	31-32 RELATIVE HUMIDITY %					
				5 Blow Room Loss.	6 Card Room Loss.	7 Spinning Loss.	8 Total Loss.	9 Yarn Breakages per 100 spindles per hour.	10 Front Roller Speed R.P.M.	11 Draft.	12 Turns per Inch.	13-16 LEA.				17-20 BALLISTIC.				21-29 SINGLE THREAD.							31 Spinning Room.	32 Spinning Room.	33 Testing Room.			
												13 Counts Actual.	14 Strength lbs.	15 Irregularity (%).	16 Count-Strength Product.	17 Counts Actual.	18 Work of Rupture (inch-lbs.)	19 Work Irregularity (%).	20 Count-Work Product.	21 Counts.	22 Strength ozs.	23 Irregularity (%).	24 Weakness Percent- age.	25 Extension (%).	26 Irregularity (%).					27 Evenness class.	28 Keps per yard.	29 Turns per Inch Actual.
247	1926-27	28-4-27	20A	8.6	10.7	0.4	18.6	2	180	6.76	16.85	20.4	60.0	9.5	1,224	..	..	..	..	..	10.6	12.0	1.0	7.2	7.0	4	2.1	..	82	68	62
346	1927-28	17-1-28	"	3.3	6.5	0.2	9.7	5	190	4.90	16.85	19.6	73.9	7.1	1,448	..	..	..	..	20.4	10.6	11.1	3.0	7.0	5.8	3	1.9	16.2	81	73	68
468	1928-29	25-1-29	"	7.6	10.2	0.3	17.4	10	182	5.26	16.85	19.4	72.0	9.6	1,397	..	..	..	..	19.8	9.9	14.5	6.5	6.2	8.7	4	3.3	16.2	84	60	72
628	1929-30	29-11-29	"	4.3	6.3	0.5	10.8	40	190	4.90	16.85	20.0	59.1	8.1	1,182	20.1	124.2	4.1	2,496	20.6	10.0	18.8	17.0	7.4	9.3	3	2.8	16.4	81	66	71	
962/1	1930-31	23-1-31	"	5.0	7.0	0.3	10.0	5	178	5.34	16.85	20.2	67.8	8.0	1,365	..	..	..	..	20.3	11.5	11.7	8.5	7.1	8.9	3	1.7	16.2	81	71	71
962/2	"	"	"	3.1	7.0	0.3	10.2	10	178	5.34	16.85	20.1	70.1	7.7	1,530	..	..	..	..	21.4	10.7	13.2	6.5	7.2	7.8	3	1.5	16.3	81	71	70
247	1926-27	28-4-27	20B	..	..	..	..	2	171	6.82	17.98	20.1	76.6	8.2	1,540	..	..	..	..	..	12.0	12.8	2.0	7.5	6.2	4	2.2	..	83	66	62
346	1927-28	17-1-28	"	..	..	..	..	5	192	4.85	17.98	19.6	83.4	6.7	1,635	..	..	..	..	20.7	11.4	13.0	3.5	7.0	7.6	2	1.9	17.2	82	70	66
468	1928-29	25-1-29	"	..	..	..	..	20	182	5.26	17.98	19.3	85.5	5.6	1,650	..	..	..	..	20.1	11.2	14.1	5.5	6.5	7.7	4	3.4	17.3	83	65	72
628	1929-30	30-11-29	"	..	..	..	..	32	188	4.85	17.98	19.7	72.7	6.9	1,432	19.9	128.2	3.6	2,551	19.9	11.5	12.1	4.7	7.3	8.5	3	2.3	17.5	79	67	66
962/1	1930-31	28-1-31	"	..	..	..	..	5	191	5.34	17.98	20.1	82.1	8.6	1,650	..	..	..	..	20.6	12.1	11.8	4.0	7.0	8.9	3	2.2	17.3	82	71	71
962/2	"	"	"	..	..	..	..	10	191	5.34	17.98	20.1	84.9	5.4	1,706	..	..	..	..	20.6	12.4	10.6	1.0	7.6	7.7	3	2.0	17.5	82	71	70
247	1926-27	28-4-27	20Q	..	..	..	..	5	159	6.82	19.26	20.0	90.2	5.1	1,804	..	..	..	..	..	12.7	13.1	1.0	7.6	7.6	4	2.0	..	90	67	63
346	1927-28	17-1-28	24	..	..	..	..	8	176	5.95	19.73	23.7	64.1	8.7	1,519	..	..	..	..	24.2	9.6	11.4	4.5	6.6	8.9	3	2.7	10.0	81	70	66
468	1928-29	25-1-29	"	..	..	..	..	30	165	6.32	19.73	22.7	66.9	7.1	1,519	..	..	..	..	22.6	9.8	11.2	1.5	6.3	9.4	5	2.2	19.0	83	67	72
628	1929-30	2-12-29	26	..	..	..	..	31	168	6.25	20.23	25.7	39.9	9.4	1,025	25.8	86.5	3.9	2,232	25.6	8.4	14.2	6.0	7.0	8.6	5	2.6	19.7	82	67	68
962/1	1930-31	28-1-31	"	..	..	..	..	22	165	6.91	20.23	26.2	53.6	6.7	1,404	..	..	..	..	26.3	8.9	13.2	4.5	6.3	10.6	4	3.0	19.3	82	71	72
962/2	"	"	"	..	..	..	..	22	165	6.91	20.23	26.0	54.4	10.0	1,414	..	..	..	..	27.4	8.2	14.1	9.0	6.8	9.6	4	1.5	19.6	82	71	69

* Diameter of ring frame front roller— $\frac{7}{8}$ ". Diameter of rings— $1\frac{1}{8}$ ".

13 (b).—VERUM 262 (AKOLA).

Seasons	..	{	1927-28 (Sample No. 320).
			1928-29 (Sample No. 435).
			1929-30 (Sample No. 618).
			1930-31 (Sample No. 908).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum verum*.
- (ii) *History* :—A pure line strain first isolated by selection in 1924, and known as strain No. 262.
- (iii) *District of growth* :—Central Provinces and Berar. The particular samples used in these tests have been grown at the Experimental Farm, Akola, Berar.
- (iv) *Growing period* :—June to January.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—28 inches.
- (vii) *Temperature* :—Maximum temperatures : June—110°F., January—85°F.
- (viii) *Plant particulars* :—
- (a) Bolls per plant : 18 (spacing 18" × 9").
- (b) Seeds per boll : 21.
- (c) Weight of seed : 54 milligrammes.
- (d) Weight of lint per seed : 29.6 milligrammes.
- (e) Ginning percentage : 33 (In bulk field samples from 32 to 35 per cent.).
- (ix) *Yield of seed cotton* :—From 300 to 1,000 lbs. per acre according to the soil conditions.
- (x) *Area under cultivation* :—About 5,000 acres in 1928-29.
 ,, 35,000 ,, 1929-30.

II. GRADER'S REPORT.

	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	Berar.	Broach.	Broach.	Broach.
Class	Superfine.	Fine.	Fine.	Fine.
Colour	White.	White.	White.	White.
Staple Length	$\frac{3}{4}$ inch.	$\frac{1}{2}$ inch.	$\frac{1}{2}$ -1 inch.	$\frac{3}{4}$ inch.
Staple Strength	Good.	Good.	Poor.	Good.
Regularity	Good.	Fair.	Fair.	Good.
Value above or below contract rate	Rs. 15 on.	Rs. 30 on.	Rs. 5/10 on.	Rs. 20 on
Basis	Rs. 365.	Rs. 350.	Rs. 320.	Rs. 194.
Date of Valuation		19-11-28.	19-11-29.	29-11-30.
Remarks	Broach is 30 on. Berar equal to C. P.	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch. .	Percentage.			
	1927-28.	1928-29.	1929-30.	1930-31.
2	..	..	0.3	..
3	1.7	2.3	1.6	2.3
4	3.5	4.1	3.6	4.9
5	8.6	8.5	9.3	13.5
6	23.8	20.9	21.0	30.7
7	43.0	35.5	33.8	31.5
8	16.4	20.7	21.1	13.3
9	2.9	5.9	7.5	3.8
10	..	2.1	1.8	..
2. Fibre-Length (inch) :—				
(a) By Balls Sorter	0.83	0.85	0.85	0.80
(b) By Baer Sorter	0.83	0.82	0.83	0.79
3. Fibre-Weight per inch (millionth of an ounce) ..	0.210	0.187	0.176	0.170
4. Fibre-Strength (oz.) :—				
(a) By Balls Tester	0.208	0.181	0.179	0.163
(b) By O'Neill Tester .. .. .	..	0.168	0.163	0.173
5. Fibre-Strength per unit fibre-weight per inch ..	0.99	0.93	0.97	0.99
6. Fibre-Rigidity (millionth of an ounce, square inch) .. .. .	..	0.136	0.202	0.237
7. Ribbon-Width (thousandth of an inch) .. ..	..	0.63	0.63	0.63
8. Convolutions per inch .. .. .	..	79	88	79

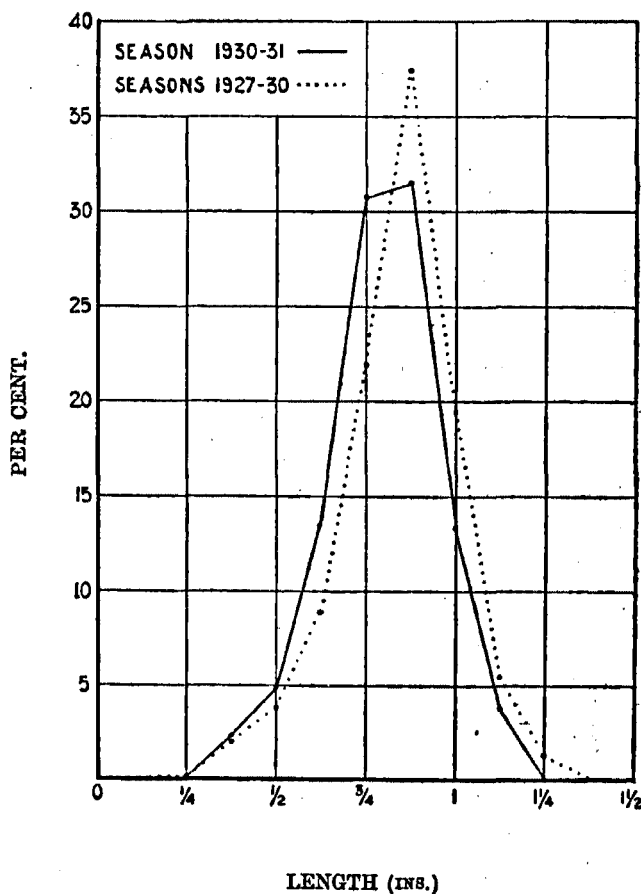


FIG. 14 (b)—Sorter Diagrams for Verum 262 (Akola).

IV. SPINNING TESTS.

1. *Treatment*.—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The Akola cotton of the 1927-28 season was passed twice through the Crighton; otherwise its treatment was the same as for the other cottons.
2. *Spinning Master's Report*.—

1927-28 cotton: light cream; bright; the staple is on the fine side for its length and is fairly strong; the cotton has a soft and bodied feel, but is a little too much stained; unginned and partly ginned seeds present (0.47 per cent.) otherwise well-ginned; gives a very good card web. Frequent breakages in the ring frame made it necessary to reduce the spinning speed for the 20's yarns with 16.85 turns per inch.

1928-29 cotton: white to creamy-white; clean; bright with a slightly silky and bodied feel; well-ginned.

1929-30 cotton: white to creamy-white; fairly bright; clean; well-ginned except for full clean seeds (0.94 per cent.); has a good feel; staple is fine and strong, but somewhat irregular.

1930-31 cotton: white to creamy-white; clean; bright; has a good feel and is well-ginned. The staple is fairly regular but on the weak side. The card web is even and clear and the sliver clean. Ten full-sized flat strips weighed 14.0 grams. The front-roller speed in both the 20's A and the 20's B is about five per cent. too high for the spinning capacity of the cotton.
3. *Spinning Test Results*.—See Table 13 (b), page 77.

V. REMARKS.

(i) *Fibre*.—The fibre-length is much the same in each season, but in 1930-31 is some 4 per cent. shorter than usual. There is some variation in fibre-weight per inch, the highest value being recorded in 1927-28. The fibre-strength is also variable, the least value in 1930-31 being 19 per cent. lower than the highest in 1927-28. The fibre-strength per unit fibre-weight per inch is practically the same in all seasons except in 1928-29 when the value is some 7 per cent. less than usual. The fibre-rigidity is variable, being exceptionally low in 1928-29. The ribbon-width is the same in all the three seasons. The number of convolutions is variable in each season.

(ii) *Waste*.—This cotton is generally in a clean condition, giving a small blow-room loss,—particularly in 1928-29 and 1930-31.

(iii) *Breakages*.—Yarn breakages in the ring frame are rather numerous in all counts of 1930-31, and in 20's counts of 1928-29 spun with 16.85 turns per inch.

(iv) *Yarns*.—This cotton usually gives even yarns in 20's counts but the 1930-31 yarns were slightly inferior in evenness. The cotton generally gives yarns free from neppiness, but those of 1928-29 and 1930-31 were somewhat neppy. The yarn strength results show distinct seasonal variation.

(v) *Conclusion*.—The cotton has given its worst result in 1930-31. The following are the highest standard warp counts for which the cotton is adjudged suitable in the different seasons:—

1927-28	..	..	19
1928-29	..	..	23
1929-30	..	..	21
1930-31	..	..	18

TABLE 13 (b)—SPINNING TEST RESULTS FOR VERUM 262 (AKOLA).

HANK (1930-31)
 Draw-frame .. 0.17
 Slubber .. 0.72
 Inter .. 1.63
 Rover ... 4.00

TRAVELLER COUNTS.

20 3/0
 26 5/0

SPINDLE SPEED (1930-31)

20 A .. 9,400 r.p.m.
 20 B .. 9,650 r.p.m.
 26 .. 8,900 r.p.m.

1 Sample No.	2 Season.	3 Date of Spinning.	4 Counts Nominal.	5 WASTE PERCENTAGES.				6 RING FRAME PARTICULARS.*				7 YARN TEST RESULTS.												29 TEMPERATURE OF Spinning Room.	30 RELATIVE HUMIDITY, %.						
				8 Blow Room Loss.	9 Card Room Loss.	10 Spinning Loss.	11 Total Loss.	12 Yarn Breakages per 100 spindles per hour.	13 Front Roller Speed R.P.M.	14 Draft.	15 Turns per Inch.	16 LEA.				17 BALLISTIC.				18 SINGLE THREAD.					31 Spinning Room.	32 Spinning Room.	33 Testing Room.				
												19 Counts Actual.	20 Strength lbs.	21 Irregularity (%).	22 Count-Strength Product.	23 Counts Actual.	24 Work of Rounce (inch-lb.)	25 Work Irregularity (%).	26 Count-Work Product.	27 Counts.	28 Strength ozs.	29 Irregularity (%).	30 Weakness Percentage.					31 Extension (%).	32 Irregularity (%).	33 Evenness class.	34 Keps per yard.	35 Turns per Inch Actual.
320	1927-28	3-11-27	14	6.5	6.5	0.2	12.8	4	188	3.82	15.08	13.4	122.6	3.9	1643	..	..	..	..	13.4	16.2	9.4	2.5	7.6	7.2	2	1.2	14.7	86	68	65
320	1927-28	2-11-27	20A	6.5	6.5	0.2	12.8	10	180	5.32	16.85	19.2	57.5	7.8	1104	..	..	..	..	19.7	9.3	13.6	6.0	6.3	6.8	3	1.2	14.3	81	64	61
435	1928-29	8-11-28	"	4.4	7.3	0.3	11.7	40	195	4.70	16.85	20.0	60.7	8.5	1214	..	..	..	..	20.4	10.0	13.2	6.5	6.6	7.4	3	3.3	16.4	83	69	71
618	1929-30	7-11-29	"	6.4	6.6	0.2	12.7	25	190	5.13	16.85	19.7	60.2	8.1	1186	20.0	116.8	4.4	2336	20.4	9.0	13.4	5.5	6.5	10.1	3	1.1	16.2	85	68	65
908/1	1930-31	14-11-30	"	4.7	7.7	0.6	12.6	80	185	5.21	16.85	19.5	5.8	8.9	1088	19.8	115.0	3.5	2277	20.7	9.0	15.7	9.0	6.7	9.2	3	2.0	15.9	83	64	63
908/2	"	"	"	4.2	7.7	0.6	12.2	75	185	5.20	16.85	19.8	55.1	9.6	1080	19.7	120.0	4.1	2364	20.8	8.8	14.8	8.6	6.8	6.2	3	3.2	16.2	83	64	70
320	1927-28	2-11-27	20B	..	..	..	..	13	190	5.48	17.98	19.9	65.0	7.9	1293	..	..	..	..	20.0	10.0	12.5	6.5	6.2	9.6	4	1.0	17.3	83	67	65
435	1928-29	8-11-28	"	..	..	..	..	7	190	4.70	17.98	19.6	76.2	7.0	1494	..	..	..	..	19.7	11.4	11.6	5.5	7.0	6.9	3	3.6	17.3	84	68	72
618	1929-30	7-11-29	"	..	..	..	..	15	192	5.10	17.98	20.0	69.9	5.6	1398	20.2	120.6	3.9	2436	20.4	10.3	11.7	2.7	6.8	8.6	3	0.8	17.3	87	68	65
908/1	1930-31	13-11-30	"	..	..	..	..	55	192	5.31	17.98	19.9	61.8	9.2	1230	20.1	119.2	3.7	2396	21.0	10.0	12.0	5.0	7.1	6.5	3	2.2	17.0	85	69	68
908/2	"	"	"	..	..	..	..	30	192	5.31	17.98	19.5	62.3	7.7	1215	19.7	121.0	3.3	2384	19.9	10.6	15.0	9.0	7.1	7.2	4	3.7	17.4	85	69	68
435	1928-29	8-11-28	26	..	..	..	..	26	169	6.13	20.23	26.2	47.7	10.4	1250	..	..	..	..	26.3	7.6	15.7	8.5	6.1	10.4	4	4.0	19.4	85	69	72
618	1929-30	7-11-29	"	..	..	..	..	23	169	6.58	20.23	25.7	42.3	10.1	1087	26.0	85.5	4.7	2223	25.8	7.7	14.2	8.0	6.0	11.8	5	1.1	19.3	89	66	64
908/1	1930-31	14-11-30	"	..	..	..	..	24	142	6.76	20.23	25.1	38.0	9.9	954	25.2	93.0	3.5	2344	26.1	7.5	13.3	7.0	6.7	8.6	5	2.7	19.2	84	62	65
908/2	"	"	"	..	..	..	..	36	142	6.68	20.23	25.7	36.4	17.4	935	25.8	92.0	3.4	2374	26.1	7.1	13.6	5.0	6.6	9.5	5	2.0	19.6	84	62	68

* Diameter of ring frame front roller— $\frac{7}{8}$ ". Diameter of rings— $1\frac{1}{8}$ ".

14—UMRI BANI.

Seasons	..	{	1924-25 (Sample No. 82).
			1925-26 (Sample No. 114).
			1926-27 (Sample No. 203).
			1927-28 (Sample No. 333).
			1928-29 (Sample No. 451).
			1929-30 (Sample No. 635).
			1930-31 (Sample No. 981).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium indicum* (see “ History ” below).
- (ii) *History* :—Umri Bani is not a pure strain or selected type but is the nearest approach to pure Bani (*G. indicum*) grown on a commercial scale, Umri being one of the best localities for it. (*Reference*—Indian Cotton Committee Report, 1919, page 106.)
- (iii) *District of growth* :—Bani (also known as Hyderabad *Gaorani*) is grown in a state of comparative purity in the Nander district and in parts of Parbhani and Bidar districts of the Nizam’s Dominions ; it forms an important component of the cottons of the whole of the Mahratwara Division of Hyderabad.
- (iv) *Growing period* :—Sown in June and picked from October to December.
- (v) *Soil* :—Mainly black cotton soil.
- (vi) *Rainfall* :—From 25 inches annually in the south-west of Hyderabad State to 50 inches in the north-east.
- (vii) *Temperature* :—Varying from 55° F to 102° F from the end of June to December.
- (viii) *Plant particulars* :—(Season 1928-29).
- (a) Bolls per plant : 17.
- (b) Seeds per boll : 18.
- (c) Weight of seed : 52 milligrammes.
- (d) Weight of lint per seed : 23 milligrammes.
- (e) Ginning percentage : 28.
- (ix) *Yield of seed-cotton* :—300 lbs. per acre.
- (x) *Area under cultivation* :—
- 2,25,000 acres under Government seed.
- 5,40,000 acres under cultivators’ seed (mixed *Gaorani*, 1928-29).
- 9,71,146 acres under cultivators’ seed (mixed *Gaorani*, 1930-31).

II. GRADER’S REPORT.

	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	Oomra.	Broach.	Broach.	Nander.	Broach.
Class	Fully good.	Fully good.	..	Good.	Fine.	Barely fine.
Colour	Slight cream.	White.	White.	White.	White.
Staple Length	½ inch.	½ inch.	¾-1 inch.	¾ inch.	¾ inch.	¾ inch.
Staple Strength	Fair.	Poor.	Fair.	Fair.	Good.	Fair.
Regularity	Fair.	Poor.	Fair.	Fair.	Fair.
Value above or below contract rate	5 off.	Rs. 30 on.	Rs. 10 on.	Rs. 10 on.	Rs. 20 on.
Basis	Rs. 375.	Rs. 360.	Rs. 340.	Rs. 200.
Date of Valuation	7-1-27.	..	19-12-28.	18-12-29.	5-2-31.
Remarks	Very poor cotton, irregular and dirty, not re- presentative of the type.	..	..	Black leaf det r a c t s from value.	Rain dam- aged.	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.						
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.
2	0.2	0.8	0.9	0.4	0.5	..	0.8
3	1.7	1.7	2.2	1.8	2.2	2.2	2.3
4	3.7	3.8	4.5	4.2	4.1	4.8	5.1
5	9.1	10.2	10.9	11.3	8.8	11.0	14.2
6	20.7	23.0	24.6	26.9	21.6	25.5	30.5
7	37.0	37.6	36.4	36.0	34.5	35.5	30.8
8	21.1	17.7	15.8	15.7	21.8	16.7	12.3
9	5.6	4.2	4.2	3.3	5.5	4.3	3.5
10	0.9	1.0	0.5	0.4	1.0	..	0.5

2. Fibre-Length (inch) :—

(a) By Balls Sorter	0.85	0.83	0.81	0.82	0.84	0.82	0.79
(b) By Baer Sorter	0.86	0.83	0.82	0.81	0.83	0.80	0.81
3. Fibre-Weight per inch (millionth of an ounce)	0.184	0.184	0.200	0.192	0.185	0.162	0.175
Fibre-Strength (oz.):—							
(a) By Balls Tester .. ..	..	..	0.193	0.169	0.184	0.162	0.170
(b) By O'Neill Tester .. ..	..	..	0.180	0.190	0.169	0.181	0.182
5. Fibre-Strength per unit fibre-weight per inch .. ..	..	..	0.93	0.94	0.96	1.13	1.01
6. Fibre-Rigidity (millionth of an ounce, square-inch) .. ..	..	..	0.160	0.188	0.196	0.185	0.189
7. Ribbon-Width(thousandth of an inch)	0.63	0.72	0.67	0.63	0.63	0.64	0.67
8. Convolutions per inch	78	87	65	93	88	90	122

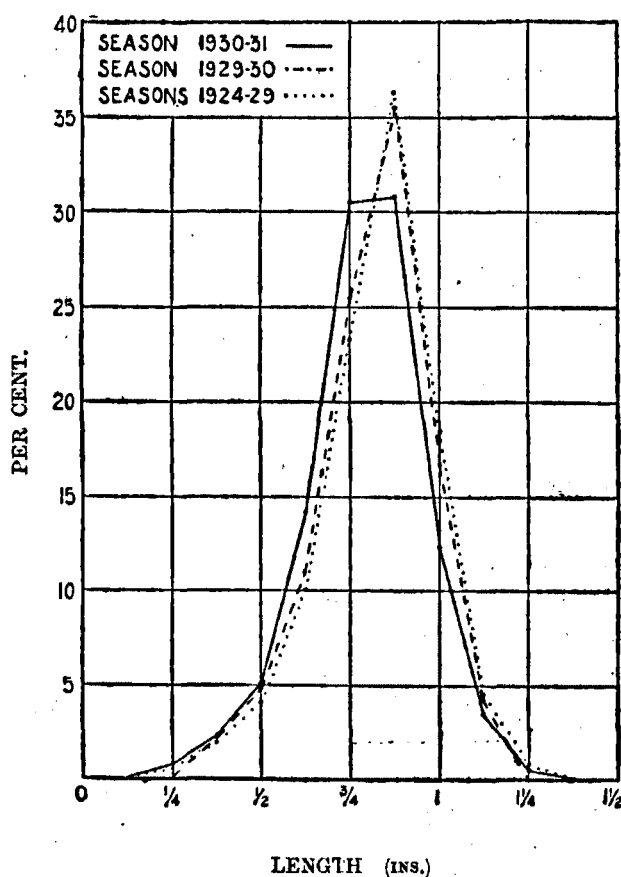


FIG. 14.—Sorter Diagrams for Umri Bani.

IV. SPINNING TESTS.

1. *Treatment*:—Lattice Feeder, Crighton (twice), Hopper Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1.

2. *Spinning Master's Report*:—

1924-25 cotton: very leafy indeed, and also very badly stained; to make a clean yarn would entail 20 per cent. blow room loss.

1925-26 cotton: very leafy and a little seedy.

1926-27 cotton: white strongish fibre but fine leaf in excess: contains too many seeds (0.86 per cent.)—clean and unginned—and far too much cut seed: the cotton is also knotted and strung by ginning; lap is clean but too knotty; card web a little neppy.

1927-28 cotton: creamy to creamy-white, dull, and stained; very leafy (fine leaf) and stringy. Frequent breakages on the ring frame made it necessary to reduce the spinning speed for the 30's yarns.

1928-29 cotton: creamy-white; leafy; slightly stained; has a good feel; fairly well ginned, but contains too many (0.55 per cent.) complete seeds, some not ginned; staple is fairly strong.

1929-30 cotton: creamy-white; somewhat dull; contains too much sand and very fine leaf and is a little stained; has a softish feel; well-ginned but contains seeds (1 per cent.); the staple is on the short side but fairly strong; card sliver is clean and free of nep.

1930-31 cotton: white to creamy-white; very bright; a trifle leafy; it has a good feel; well ginned; the staple is fairly regular in length and of good strength. The card web is first class and shed a good deal of fly; the sliver is clean and flat strips are light in weight, ten of them weighing 11.3 grams.

3. *Spinning Test Results*:—See Table 14, page 81.

Card Production for Sample No. 82:—12.0 lb. per hour.

Ring Frame Production for 20's-A, Sample No. 82:—7.87 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—With a few exceptions the fibre properties of this cotton do not show much variation. The 1926-27 cotton has a high fibre-weight per inch but low rigidity and fewer convolutions per inch. The 1929-30 cotton is exceptionally fine and its fibre is comparatively strong. The 1930-31 cotton is remarkable for an increase of 35 per cent. in the number of convolutions per inch.

(ii) *Waste*.—The blow-room loss and the card-room loss are both normal in 1930-31 but moderately high in the remaining seasons except 1924-25 when they are very high.

(iii) *Breakages*.—Yarn breakages in the ring frame are comparatively few except for the 1930-31 cotton spun into 30's counts with 21.86 turns per inch.

(iv) *Yarns*.—The 20's yarns of this cotton are usually even to fairly even, though in 1924-25 they are only fairly even. The yarns are almost free of nep in 1926-27, 1929-30 and 1930-31; they are somewhat neppy in the remaining seasons. The yarn-strength results show slight variation during the first five seasons and since 1929 they are decidedly stronger.

(v) *Conclusion*.—The 1930-31 cotton is comparatively much cleaner than its predecessors and has maintained the superior results for yarn-strength of the last season. The following are the highest standard warp counts for which this cotton is suitable in different seasons:—

1924-25	..	22's.	1928-29	..	22's.
1925-26	..	24's.	1929-30	..	27's.
1926-27	..	24's.	1930-31	..	28's.
1927-28	..	24's.			

TABLE 14.—SPINNING TEST RESULTS FOR UMRI BANI.
TRAVELLER COUNTS.

SPINDLE SPEED (1930-31).

HANK (1930-31.)
Draw-frame .. 0.19
Slubber .. 0.72
Inter .. 1.60
Rover .. 4.00

20^s .. 3/0
24^s .. 5/0
30^s .. 7/0

20^s .. 8,900 r. p. m.
24^s .. 9,250 r. p. m.
30^s .. 9,550 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F).	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lvs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).					Evenness class.	Neps per yard.	Turns per inch. Actual.
82	1924-25	6-1-26	20A	..	..	..	..	30	182	5.20	16.85	19.7	60.7	8.6	1,196	..	..	..	..	..	9.3	13.4	8.5	5.1	10.9	5	4.1	..	72	72	55
114	1925-26	9-4-26	"	..	..	..	..	2	181	5.13	16.85	19.3	70.6	10.0	1,303	..	..	..	..	..	9.6	13.0	3.2	5.0	16.2	3	4.5	..	85	64	62
203	1926-27	7-1-27	"	..	..	..	..	15	183	5.15	16.85	20.4	64.2	7.3	1,310	..	..	..	..	..	10.0	13.3	6.7	5.8	9.7	3	1.6	..	83	69	51
333	1927-28	20-12-27	"	..	..	..	..	10	186	5.18	16.85	20.1	65.9	6.4	1,325	..	..	..	..	..	9.4	15.2	9.7	6.7	8.4	3	4.1	16.3	82	68	67
451	1928-29	18-12-28	"	..	..	..	..	35	193	5.33	16.85	20.0	61.8	9.7	1,236	..	..	..	..	..	10.4	13.7	6.5	6.6	7.4	4	3.1	16.3	79	65	68
635	1929-30	13-12-29	"	..	..	..	..	22	191	5.10	16.85	19.5	77.9	7.4	1,519	19.6	129.6	3.0	2,520	20.0	11.9	12.6	5.5	7.7	7.0	3	1.4	16.3	82	69	63
82	1924-25	9-1-26	20B	15.9	10.7	0.7	25.3	10	170	5.13	17.98	19.6	72.4	9.5	1,419	..	..	..	..	..	11.1	12.9	2.5	5.4	9.5	6	3.9	..	71	72	69
114	1925-26	9-4-26	"	12.9	8.6	0.5	20.8	10	168	5.26	17.98	19.7	78.2	8.3	1,541	..	..	..	..	..	10.6	10.3	2.7	5.2	14.3	4	3.7	..	85	65	65
203	1926-27	8-1-27	"	11.5	7.6	0.3	18.5	7	169	5.21	17.98	20.4	74.9	7.4	1,528	..	..	..	..	..	12.4	10.8	3.5	7.3	7.7	4	1.9	..	82	70	59
333	1927-28	20-12-27	"	11.6	9.0	0.4	19.9	12	190	5.18	17.98	20.0	73.8	7.3	1,576	..	..	..	..	..	11.0	11.1	3.2	7.1	7.9	3	5.6	17.5	80	66	69
451	1928-29	18-12-28	"	11.7	8.9	0.2	19.8	10	193	5.33	17.98	19.8	76.8	6.8	1,571	..	..	..	..	..	11.5	12.5	5.7	6.8	7.5	4	4.7	17.4	80	66	69
635	1929-30	13-12-29	"	12.0	8.1	0.2	19.3	15	186	5.15	17.98	19.8	82.0	5.3	1,024	19.5	132.6	3.3	2,586	20.5	11.9	12.5	5.2	7.2	6.9	4	1.1	17.4	83	66	67	
981/1	1930-31	9-2-31	"	9.1	7.3	0.3	15.9	0	196	5.38	17.98	20.6	86.1	5.7	1,774	20.7	130.4	3.7	2,699	21.2	12.3	10.4	1.5	7.2	8.2	3	1.2	17.2	81	69	70	
981/2	"	"	"	8.7	6.9	0.4	15.4	0	196	5.25	17.98	20.1	91.2	7.4	1,833	20.0	133.2	3.2	2,664	20.6	13.4	12.1	4.5	7.5	9.7	3	1.7	16.9	81	69	71	
82	1924-25	9-1-26	20C	..	..	..	..	12	155	5.20	19.26	19.7	80.6	6.2	1,538	..	..	..	..	..	11.4	11.6	2.5	5.6	10.2	6	5.1	..	71	72	58
114	1925-26	10-4-26	"	..	..	..	..	5	154	5.26	19.26	19.7	83.4	6.2	1,642	..	..	..	..	..	11.5	10.5	1.2	4.8	17.9	3	3.1	..	86	62	64
203	1926-27	8-1-27	"	..	..	..	..	7	159	5.32	19.26	19.3	94.4	5.9	1,822	..	..	..	..	..	12.3	10.0	1.5	6.7	7.7	3	2.2	..	83	70	60
451	1928-29	19-12-28	24	..	..	..	..	13	167	6.46	19.73	23.9	56.0	8.6	1,338	..	..	..	..	..	9.3	13.9	6.0	6.9	8.8	5	5.2	19.2	81	63	70
635	1929-30	14-12-29	"	..	..	..	..	24	167	6.13	19.73	23.1	66.7	6.0	1,541	23.5	101.0	4.7	2,373	23.7	9.9	12.1	4.2	7.1	7.8	5	1.8	19.0	83	69	66
981/1	1930-31	10-2-31	"	..	..	..	..	8	173	6.13	19.73	23.4	72.9	4.6	1,706	23.8	111.0	3.3	2,642	23.0	11.9	9.3	2.5	7.3	8.4	4	1.5	19.2	80	64	69
981/2	"	"	"	..	..	..	..	4	173	6.54	19.73	23.6	71.9	5.0	1,697	23.5	108.2	1.7	2,543	24.6	10.8	12.3	3.5	7.5	9.0	4	2.0	18.6	80	64	71
333	1927-28	20-12-27	30	..	..	..	..	15	140	7.81	21.86	29.9	39.9	10.8	1,193	..	..	..	..	..	5.8	15.6	10.5	5.7	12.4	5	5.1	21.4	83	68	60
981/1	1930-31	11-2-31	"	..	..	..	..	37	161	7.58	21.86	30.3	43.7	9.0	1,324	31.3	82.6	2.4	2,585	32.5	7.3	12.7	8.0	6.1	11.3	6	2.0	20.9	81	68	71
981/2	"	"	"	..	..	..	..	33	161	7.58	21.86	30.9	40.5	8.7	1,251	29.2	85.0	3.0	2,482	32.3	7.6	14.9	8.5	6.5	12.1	6	2.5	20.8	81	68	71

* Diameter of ring frame front roller - 7/8 inch. Diameter of rings - 1 1/8 inch.

15.—CAMBODIA Co. 1 (295).

Seasons ..	}	1923-24 (Sample No. 105).
		1924-25 (Sample No. 84).
		1925-26 (Sample No. 126).
		1926-27 (Sample No. 265).
		1927-28 (Sample No. 374).
		1928-29 (Sample No. 496).
		1929-30 (Sample No. 735).
		1930-31 (Sample No. 1049).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species.*—*Gossypium hirsutum*.
- (ii) *History.*—A selection from a mixed crop of Cambodia grown in 1920-21; Cambodia seed was first introduced about 1905.
(Reference—Madras Department of Agriculture Annual Report, 1924-25.)
- (iii) *District of growth:*—Cambodia is grown generally in the Coimbatore district and in parts of Southern Madras (South Arcot, Chittoor, Salem, Coimbatore, Trichinopoly, Madura, Ramnad, and Tinnevely districts); about half the crop is grown under irrigation. The 1923-28 samples used in these tests have been grown on the Farm of the Cotton Breeding Station, Coimbatore; the 1928-29 sample has been grown at Bhavani, the 1929-30 sample at Avanachi and the 1930-31 sample at Pollachi (Coimbatore district).
- (iv) *Growing period.*—Sown from early October until early November, and picked during March-April, and also during July-August (when a second flush is obtained).
- (v) *Soil.*—Red loam; at Bhavani, light clay loam.
- (vi) *Rainfall:*—26 inches annually.
- (vii) *Temperature:*—October 1925—May 1926: Mean minimum 67°F.; mean maximum 90°F.
- (viii) *Plant particulars:*—
- (a) Bolls per plant: 10 (spacing: 12" × 18").
- (b) Seeds per boll: 32.
- (c) Weight of seed: 120 milligrammes.
- (d) Weight of lint per seed: 62 milligrammes.
- (e) Ginning percentage: 35.
- (ix) *Yield of seed-cotton.*—500 lbs. per acre (Cotton Breeding Station, Coimbatore); normally 250 lbs. per acre in irrigated tracts, and ranging from 50 to 100 lbs. per acre in unirrigated tracts.
- (x) *Area under cultivation:*—

1925-26 ..	1,000 acres.
1926-27 ..	9,800 ,, yielding 4,500 bales.
1927-28 ..	13,600 ,, ,, 5,100 ,,
1929-30 ..	26,000 ,,

Cambodia 295 is now being replaced by Cambodia Co. 2.

II. GRADER'S REPORT.

	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under	Cambodia	Cambodia	Cambodia	Cambodia	F.G. Broach	Broach.	Broach.	Broach.
Class	Extra Superfine	Fine	Superfine	Fine	Superfine	Fine.	Extra Superfine	Superfine.
Colour	Good.	Creamy.	Slightly creamy.	White.	Creamy.	White creamy	Slight creamy.	White.
Staple Length ..	17/16-9/8 inch.	7/8-15/16 inch.	15/16-17/16 inch.	15/16-17/16 inch.	1 inch.	1 1/16 inch.	1 1/2 Bare.	1-1 1/8 inch.
Staple Strength .	Good.	Good.	Fair.	Good.	Good.	Good.	Good	Fair.
Regularity	Regular.	..	Regular.	Good.	Regular.	Good.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	..	Pass.	Rs. 115 to 120 on.	Rs. 80 on.	Rs. 80 on.	Rs. 65 on.
Basis .. ..	..	..	..	Rs. 400.	Rs. 368.	Rs. 354.	Rs. 200.	Rs. 175.
Date of Valuation	..	..	..	..	28-4-28	12-4-29.	24-5-30.	30-5-31
Remarks .. ..	..	Staple not as good as in 1923-24.	..	..	..	..	..	not typical.

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.2	0.7	0.3	..	0.8	0.4	0.3	0.4
3	1.8	2.1	2.2	1.2	2.4	1.2	1.5	1.9
4	2.9	3.6	3.6	2.9	3.8	2.7	3.3	3.6
5	5.7	7.6	6.8	5.9	6.0	5.7	7.3	7.1
6	11.5	15.4	12.2	11.6	10.4	11.7	14.6	17.5
7	24.6	33.6	22.9	23.4	19.2	23.7	31.4	35.0
8	31.4	26.4	32.9	35.4	33.8	33.0	27.7	25.4
9	17.7	9.1	15.5	16.5	19.0	16.1	9.9	7.4
10	4.1	1.5	3.6	2.8	4.3	4.1	2.8	1.7
11	0.1	..	..	0.3	0.3	1.4	1.2	..
2. Fibre-Length (inch) :—								
(a) By Balls Sorter ..	0.92	0.87	0.91	0.93	0.92	0.93	0.89	0.86
(b) By Baer Sorter ..	0.91	0.85	0.92	0.92	0.95	0.93	0.89	0.88
3. Fibre-Weight per inch (millionth of an ounce) ..								
..	0.171	0.147	0.156	0.155	0.164	0.170	0.146	0.156
4. Fibre-Strength (oz.) :—								
(a) By Balls Tester ..	0.145	0.132	0.118	0.137	0.135	0.127	0.131	0.132
(b) By O'Neill Tester ..	0.124	0.115	0.111	0.117	0.141	0.123	0.142	0.139
5. Fibre-Strength per unit fibre-weight per inch								
.. ..	0.78	0.84	0.73	0.82	0.84	0.74	0.93	0.87
6. Fibre-Rigidity (millionth of an ounce, square-inch) ..								
..	0.154	0.093	0.132	0.124	0.134	0.179	0.176	0.211
7. Ribbon-Width (thousandth of an inch)								
.. ..	0.69	0.64	0.63	0.59	0.60	0.62	0.70	0.67
8. Convolutions per inch ..								
..	91	91	97	91	110	126	121	103

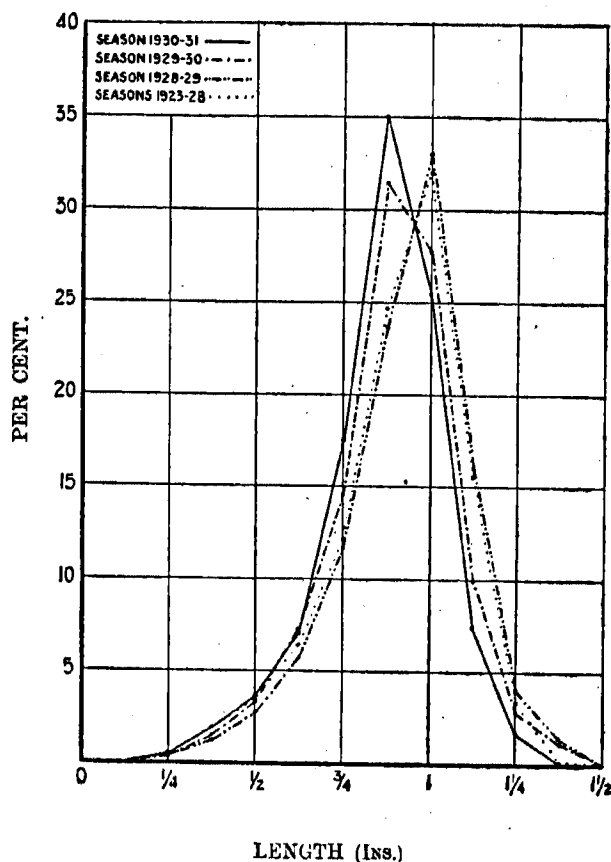


FIG. 15. Sorter Diagrams for Cambodia Co. 1 (295).

IV. SPINNING TESTS.

1. *Treatment*.—1923-24 and 1928-29 Cottons; Lattice Feeder, Crighton (once), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1929-30 and 1930-31 cottons were passed twice through the Crighton; the cottons of the other seasons were passed direct through the Crighton (once only); otherwise their treatments were the same as for the 1923-24 and 1928-29 cottons.
2. *Spinning Master's Report*:—
 - 1923-24 cotton: very clean, creamy, and harsh to feel.
 - 1924-25 cotton: clean, and fairly free of nep.
 - 1925-26 cotton: clean, creamy, but contains far too many seeds.
 - 1926-27 cotton: slightly creamy; bright; very clean, but contains a lot of broken seeds; fairly strong.
 - 1927-28 cotton: creamy-white to creamy; bright; silky; clean; has a good feel; well-ginned.
 - 1928-29 cotton: creamy-white; fairly bright; very clean; well ginned; has a good soft feel, staple is fine, strong, and regular; a very desirable cotton.
 - 1929-30 cotton: creamy-white to creamy; very bright; has a soft and bodied feel; clean and well-ginned, except for some cut seed; the staple is very regular in length and of fair strength; the card web is good and sliver clean; ten flat strips weighed 15.3 grams.
 - 1930-31 cotton: creamy-white; fairly bright; clean; has a good-bodied feel; except for a little cut seed it is well-ginned. The card sliver is clean, web good and ten flat strips weigh 14.8 grams.
3. *Spinning Test Results*.—See Table 15, page 85.

V. REMARKS.

(i) *Fibre*.—The fibre-properties of this cotton are variable. The fibre-length is some six per cent. less than usual in 1924-25 and 1930-31. The fibre-weight and strength are very low in 1924-25 and 1925-26 respectively. The fibre-strength per unit fibre-weight per inch is lower in 1925-26 and 1928-29 than in any other season. The fibre-rigidity is subject to large fluctuations, being more than twice as much in 1930-31 as in 1924-25. The ribbon-width is comparatively low in the two seasons 1926-28. The convolutions are somewhat more numerous, and variable in number, since 1927-28.

(ii) *Waste*.—This is a very clean cotton of which no sample has given more than 4.8 per cent. blow-room loss. The card-room loss is comparatively low in 1923-24 and 1925-26.

(iii) *Breakages*.—Yarn-breakages in the ring frame are few in all cases except 30's and 34's counts of the 1930-31 cotton.

(iv) *Yarns*.—The 20's A yarns of this cotton are either very even to even or even, the 30's yarns are usually even to fairly even. The 1926-27 yarns are exceptionally even. The yarns of this cotton are usually characterised by freedom from neppiness, though in 1926-27 and 1930-31 they are slightly neppy. The yarn-strength results are very good in 1926-27, better than usual in 1927-28 and 1929-30, and rather poor in 1930-31.

(v) *Conclusion*.—The yarn-strength results of this cotton show a certain amount of seasonal variation. The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1923-24	..	32's.
1924-25	..	30's.
1925-26	..	32's.
1926-27	..	38's.
1927-28	..	34's.
1928-29	..	32's.
1929-30	..	34's.
1930-31	..	29's.

TABLE 15.—SPINNING TEST RESULTS FOR CAMBODIA Co. 1. (CAMBODIA 295.)

HANK (1930-31).
 Draw-frame 0.18
 Slubber 0.78
 Inter 1.78
 Rover 4.73

TRAVELLER COUNTS.
 20 3/0
 30 7/0
 34 9/0

SPINDLE SPEED (1930-31).
 20A .. 9400 r. p. m.
 20B .. 9800 r. p. m.
 30 .. 9750 r. p. m.
 34 .. 9400 r. p. m.

Sample No	Season.	Date of Spinning.	Counts Nominal	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURES (°F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch. lbs.)	Work Irregularity (%)	Count Work product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)					Evenness Class.	Neps per yard.	Turns per inch Actual.
105	1923-24	13-3-26	20A	4.4	6.3	0.5	11.0	15	181	4.21	16.85	19.7	84.6	6.1	1,667	..	..	..	..	..	10.5	11.4	3.2	4.4	13.1	2	1.2	..	86	72	51
84	1924-25	5-3-26	"	4.4	7.5	0.5	12.0	7	180	4.23	16.85	19.7	82.7	3.8	1,629	..	..	..	..	..	11.9	6.9	0	6.5	6.3	3	1.0	..	87	74	53
126	1925-26	10-5-26	"	4.8	6.0	0.4	10.9	2	182	4.39	16.85	19.6	83.2	4.9	1,729	..	..	..	..	..	11.3	7.7	0.7	6.0	8.4	1	2.5	..	89	65	60
265	1926-27	28-6-27	"	4.0	8.7	0.2	12.5	2	192	4.76	16.85	19.8	103.7	3.9	2,053	10.9	13.6	8.6	0.7	7.9	6.2	1	3.6	16.1	87	74	78
374	1927-28	20-4-28	"	3.5	7.8	0.1	11.2	2	190	4.54	16.85	20.1	98.5	5.0	1,799	20.3	12.1	8.6	1.0	6.5	8.2	2	2.4	16.3	87	62	69
496	1928-29	10-4-29	"	4.4	8.4	0.3	12.6	10	196	4.47	16.85	19.5	89.5	4.5	1,726	19.6	136.8	4.1	2081	19.7	12.0	8.7	0.7	8.0	7.1	2	1.8	16.2	86	62	72	
735	1929-30	19-5-30	"	4.0	7.3	0.1	11.2	2	196	4.65	16.85	19.9	87.4	5.0	1,739	19.9	138.5	4.1	2750	20.3	11.7	8.5	1.2	7.7	7.3	3	2.7	16.2	91	63	64	
1049/1	1930-31	14-5-31	"	4.7	8.4	0.5	13.2	6	198	4.44	16.85	20.0	78.8	6.0	1,576	20.2	120.0	3.6	2424	20.0	10.8	10.4	3.5	6.3	9.5	3	3.0	16.4	96	68	70	
1049/2	"	"	"	4.7	8.2	0.5	13.0	17	198	4.44	16.85	19.8	79.5	6.9	1,574	20.1	117.6	3.6	2364	20.0	10.6	11.2	6.5	5.8	13.7	3	3.7	16.2	90	68	71	
735	1929-30	20-5-30	20B	..	..	..	..	17	198	4.65	17.93	19.5	95.0	4.0	1,852	19.6	151.8	4.0	2971	20.2	12.4	8.2	1.0	7.7	7.3	3	1.9	17.3	91	63	65
1049/1	1930-31	14-5-31	"	..	..	..	..	11	196	4.50	17.93	19.8	88.0	4.2	1,742	19.8	130.2	3.3	2578	19.9	11.9	9.4	1.5	6.5	12.1	3	4.0	17.4	91	68	71
1049/2	"	"	"	..	..	..	..	6	196	4.50	17.93	19.6	86.8	4.1	1,701	20.0	126.2	3.0	2524	19.5	12.0	10.0	3.0	6.3	10.3	3	2.7	17.2	91	68	70
105	1923-24	15-3-26	30	..	..	..	..	3	142	6.35	21.86	29.5	51.5	4.7	1,519	..	..	..	..	..	7.1	10.7	2.7	4.1	28.4	4	0.7	..	85	69	56
84	1924-25	6-3-26	"	..	..	..	..	8	139	6.33	21.86	30.2	47.8	5.2	1,444	..	..	..	..	..	6.9	10.3	1.2	5.6	9.5	5	1.7	..	87	76	56
126	1925-26	6-5-26	"	..	..	..	..	10	140	6.45	21.86	30.0	50.6	7.0	1,513	..	..	..	..	..	7.0	10.0	1.5	4.0	13.0	4	2.0	..	90	63	61
265	1926-27	29-6-27	"	6	160	7.01	21.86	29.0	62.3	5.6	1,807	29.7	8.8	11.5	3.7	7.2	8.3	1	2.6	20.7	87	75	80
374	1927-28	21-4-28	"	0	150	6.82	21.86	30.4	52.8	5.0	1,605	30.9	7.3	11.5	2.7	5.5	9.5	3	3.4	21.0	87	64	63
496	1928-29	10-4-29	"	..	..	..	..	5	150	6.84	21.86	29.6	50.6	4.7	1,498	29.9	75.2	4.6	2248	30.5	7.3	11.4	4.2	6.8	8.2	4	2.4	21.0	87	65	68
735	1929-30	20-5-30	"	..	..	..	..	7	160	6.97	21.86	29.4	54.0	4.7	1,588	29.7	90.8	2.7	2691	29.7	7.5	11.6	4.2	6.7	8.1	4	2.2	21.1	91	63	66
1049/1	1930-31	14-5-31	"	..	..	..	..	27	160	6.82	21.86	30.9	45.1	7.1	1,393	31.0	81.4	3.3	2523	31.0	6.2	15.3	8.5	4.6	17.9	5	3.2	21.2	90	66	69
1049/2	"	"	"	..	..	..	..	27	160	6.82	21.86	31.0	43.2	8.0	1,339	30.7	80.2	2.6	2462	30.8	6.4	13.2	5.0	4.8	14.4	5	3.2	21.3	90	66	69
1049/1	1930-31	15-6-31	34	..	..	..	..	46	146	7.35	23.26	33.5	41.4	6.9	1,387	34.5	73.0	3.7	2518	34.0	5.9	13.3	7.0	4.6	17.7	5	3.7	23.0	90	67	69
1049/2	"	"	"	..	..	..	..	46	146	7.35	23.26	33.2	41.1	4.1	1,364	34.2	73.6	3.9	2517	34.3	5.7	13.5	7.5	4.6	17.1	5	2.7	22.3	90	67	69
105	1923-24	16-3-26	40	..	..	..	..	6	115	8.28	26.97	39.2	32.9	5.5	1,290	..	..	..	..	..	5.2	12.2	2.5	3.3	23.2	5	1.0	..	85	63	55
84	1924-25	8-3-26	"	..	..	..	..	5	113	8.33	26.97	39.3	31.9	4.9	1,254	..	..	..	..	..	5.2	11.5	3.7	4.8	12.5	6	1.7	..	85	66	53
126	1925-26	11-5-26	"	..	..	..	..	3	115	8.55	26.97	40.0	32.5	4.6	1,300	..	..	..	..	..	4.9	13.9	5.0	3.9	13.8	5	2.0	..	89	62	59
265	1926-27	30-6-27	"	6	130	9.55	26.97	40.2	37.7	5.3	1,516	40.7	5.9	13.9	6.0	6.5	10.1	3	3.0	25.6	87	74	79
374	1927-28	23-4-28	"	4	133	9.07	26.97	40.7	35.1	4.7	1,429	40.9	5.3	14.2	8.0	5.1	11.1	4	3.4	26.0	88	64	63
496	1928-29	11-4-29	"	..	..	..	..	13	133	9.20	26.97	40.5	31.7	5.2	1,284	39.7	50.7	4.9	2013	41.1	4.9	14.1	5.5	6.0	13.4	5	2.1	26.0	88	65	70
735	1929-30	21-5-30	"	..	..	..	..	2	134	9.29	26.97	39.3	34.5	4.5	1,356	39.1	68.7	2.4	2086	40.0	5.0	14.2	6.7	6.0	10.4	6	2.1	26.1	91	62	65

* Diameter of ring frame front roller— $\frac{1}{2}$ ". Diameter of rings— $\frac{1}{16}$ ".

16.—CAMBODIA Co. 2 (CAMBODIA 440).

Seasons ..	{	1924-25 (Sample No. 50).
		1925-26 (Sample No. 124).
		1926-27 (Sample No. 268).
		1927-28 (Sample No. 375).
		1928-29 (Sample No. 505).
		1929-30 (Sample No. 706).
		1930-31 (Sample No. 1,057).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A selection from a mixed crop of Cambodia cotton grown in 1920-21.
- (iii) *District of growth* :—Coimbatore.
- (iv) *Growing period* :—Early October to middle of April.
- (v) *Soil* :—Red loam.
- (vi) *Rainfall* :—From 15 to 20 inches annually.
- (vii) *Temperature* :—Minimum 53°F. in January and maximum 101°F. in May.
- (viii) *Plant particulars* :—
- (a) Bolls per plant: 8 (spacing: 36" × 9").
- (b) Seeds per boll: 35.
- (c) Weight of seed: 137 milligrammes.
- (d) Weight of lint per seed: 77 milligrammes.
- (e) Ginning percentage: 33.
- (ix) *Yield of seed-cotton* :—1,140 lbs. per acre at Cotton Breeding Station Coimbatore.
- (x) *Area under cultivation* :—1928-29..120 acres.
1929-30..1,500 „

II. GRADER'S REPORT.

	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under ..	Cambodia.	Cambodia.	F. G. Broach.	Broach.	Broach.	Broach.
Class	Superfine.	Fine.	Superfine.	Fine.	Superfine.	Barely fine.
Colour	Slightly creamy.	White.	Creamy.	Creamy.	White.	Slight cream.
Staple Length	7-1½ inch.	1½ inch.	7-1 inch.	½-1 inch.	1½ inch.	1 1/8 inch.
Staple Strength	Good.	Good.	Fair.	Good.	Good.	Good.
Regularity	Irregular.	Good.	Irregular.	Good.	Good.	Fair.
Value above or below contract rate .. ..	..	Rs. 15 on.	Rs. 100 to 110 on.	Rs. 65 on.	Rs. 65 on.	Rs. 65 on.
Basis .. .. .	..	Rs. 400.	Rs. 308.	Rs. 323.	Rs. 250.	Rs. 175.
Date of Valuation .. ..	..	..	..	8-5-20.	16-4-30.	30-5-31.
Remarks	Rather rough.	..	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.4	1.0	..	0.7	0.4	0.5	0
3	1.7	2.1	1.6	2.8	2.2	1.8	2.4
4	3.1	3.5	2.9	4.4	3.8	3.7	3.8
5	5.4	6.2	4.5	6.9	7.5	6.9	6.6
6	9.4	10.7	9.0	12.2	11.1	13.7	11.7
7	21.0	21.8	24.7	22.3	19.8	26.8	22.2
8	37.9	34.2	34.0	29.5	32.7	29.4	31.2
9	17.5	16.5	17.7	15.2	19.0	13.5	16.4
10	3.3	3.4	5.0	6.0	3.5	3.3	5.7
11	0.3	0.6	0.6	..	..	0.4	0
2. Fibre Length (inch)—							
(a) By Balls Sorter	0.93	0.92	0.94	0.90	0.91	0.90	0.92
(b) By Baer Sorter	0.90	0.92	0.94	0.87	0.93	0.89	0.93
3. Fibre-Weight per inch (millionth of an ounce)							
	0.172	..	0.168	0.141	0.148	0.136	0.133
4. Fibre-Strength (oz.)—							
(a) By Balls Tester .. ..	..	..	..	0.128	0.096	0.116	0.116
(b) By O'Neill Tester .. ..	..	..	..	0.118	0.103	0.131	0.117
5. Fibre-Strength per unit fibre- weight per inch							
	..	..	..	0.87	0.67	0.91	0.88
6. Fibre-Rigidity (millionth of an ounce, square-inch)							
	..	..	..	0.138	0.099	0.224	0.145
7. Ribbon-Width (thousandth of an inch)							
	..	..	..	0.62	0.61	0.64	0.66
8. Convolutions per inch							
	..	..	..	108	90	116	94

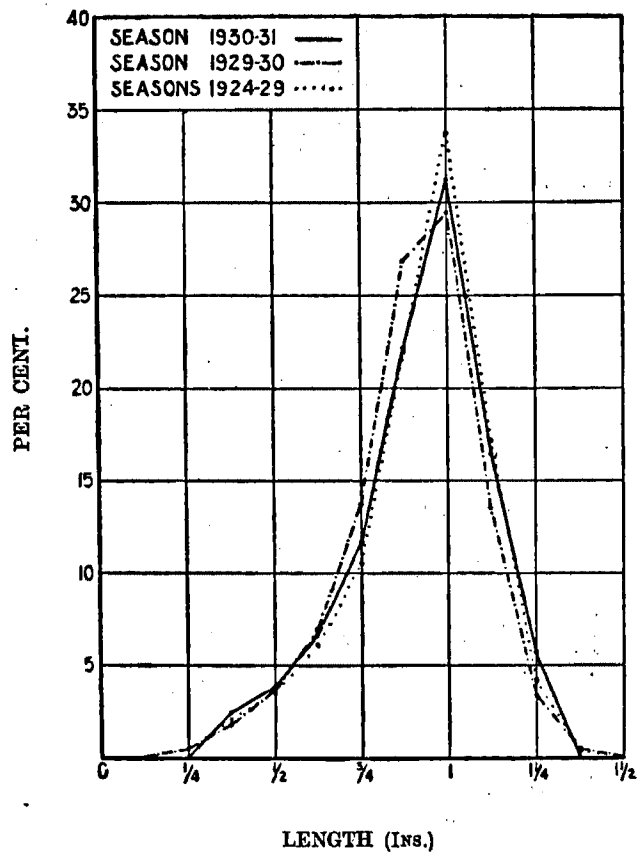


FIG. 16.—Sorter Diagrams for Cambodia Co 2 (Cambodia 440)

IV. SPINNING TESTS.

1. *Treatment* :—Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1924-25, 1928-29, 1929-30 and 1930-31 cottons were passed through the Lattice Feeder first; and the 1930-31 cotton was passed twice through the Crighton; otherwise their treatment was the same as for the cottons of the other seasons.
2. *Spinning Master's Report* :—
 - 1926-27 cotton: creamy; bright; clean; well-ginned; has a nice feel; fairly hard; staple regular.
 - 1927-28 cotton: creamy-white to creamy; bright; silky, with a good feel; clean; well-ginned; a similar cotton to Cambodia 295.
 - 1928-29 cotton: creamy-white to creamy; very clean; has a good feel and, except for being a little knotty, is well-ginned; the staple is fine and regular; a very good sample.
 - 1929-30 cotton: bright; creamy-white; perfectly clean; it has a very good feel and is well-ginned except for a little cut seed and knottiness of the lint; staple is fine, regular in length, and of good strength; a very desirable cotton.
 - 1930-31 cotton: creamy; fairly clean; has a good soft feel; well-ginned. The card sliver is clean, web a trifle neppy and ten flat strips weigh 15.3 grams.
3. *Spinning Test Results* :—See Table 16, page 89.

V. REMARKS.

(i) *Fibre*.—The fibre-properties of this cotton exhibit a fair amount of seasonal variation. The fibre-length is comparatively low in 1927-28 and 1929-30. The fibre-weight per inch is some 15 per cent. higher in 1926-27 than in the two following seasons. The fibre-strength, the fibre-strength per unit fibre-weight per inch, the fibre-rigidity and the ribbon width are all low in 1928-29. The convolutions are 20 per cent. more numerous in 1927-28 and 1929-30 than in the other two seasons.

(ii) *Waste*.—The samples of this cotton have given an exceptionally low blow-room loss in all seasons except 1930-31. The card-room loss is about 3 per cent. higher than usual in 1924-25 due to the small weight of the sample used for spinning.

(iii) *Breakages*.—Yarn-breakages in the ring frame are comparatively few in all cases except 20'sA of 1924-25 and 30's and 34's of 1928-29.

(iv) *Yarns*.—This cotton usually gives even 20's and fairly even 30's; but the 1926-27 yarns are exceptionally even. The yarns of this cotton are neppy, being rather more so in 1927-29 than in the other seasons. The strength of the yarns varies considerably with the season, being good in 1927-28, better still in 1926-27 and poor in 1925-26 and 1928-29.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons :—

1924-25	..	29's.
1925-26	..	25's.
1926-27	..	37's.
1927-28	..	33's.
1928-29	..	26's.
1929-30	..	28's.
1930-31	..	29's.

TABLE 16.—SPINNING TEST RESULTS FOR CAMBODIA Co. 2 (CAMBODIA 440).

HANK (1930-31).
 Draw-frame .. 0.18
 Slubber .. 0.74
 Inter .. 1.64
 Rover .. 4.43

TRAVELLER COUNTS.
 20° .. 3/0
 30° .. 7/0
 34° .. 9/0

SPINDLE SPEED (1930-31).
 20A .. 9,500 r. p. m.
 20B .. 9,750 r. p. m.
 30 .. 9,750 r. p. m.
 34 .. 9,400 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)										
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.								
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rapture (inch—lb.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)					Evenness Class.	Neps per yard.	Turns per inch Actual.					
																																	Spinning Room.	Testing Room.			
50	1924-25	6-8-25	20A	2.5	11.5	1.1	12.4	37	186	4.08	16.85	19.8	83.8	8.9	1,649	12.2	7.8	0	4.2	5.0
124	1925-26	4-5-26	..	3.5	8.7	0.8	12.6	15	182	4.30	16.85	19.3	74.0	6.5	1,428	..	..	..	..	10.1	10.3	1.0	5.7	7.3	..	..	..	..	..	..	..	..	..	..	..	..
268	1926-27	6-7-27	..	3.7	9.5	0.4	13.2	22	189	4.44	16.85	19.6	97.1	3.4	1,903	..	..	..	..	19.9	12.6	8.5	2.0	7.5	7.4	1	4.3	16.3	85	80	79	..	..	..	..	..
375	1927-28	23-4-28	..	3.2	8.4	0.1	11.8	10	190	4.44	16.85	19.6	89.0	4.9	1,744	..	..	..	..	20.0	12.0	10.2	2.5	7.1	5.6	8	8.3	16.2	90	66	68	..	..	..	..	..
505	1928-29	30-4-29	..	4.7	9.5	0.4	14.1	10	191	4.44	16.85	19.4	75.3	4.6	1,461	19.8	110.5	3.3	2,188	20.3	9.6	9.2	2.2	6.8	8.5	3	6.7	16.1	90	66	71	..	..	..	..	..
706	1929-30	4-4-30	..	2.8	7.2	0.2	10.1	0	189	5.00	16.85	20.0	79.4	4.6	1,588	20.1	122.6	8.8	2,464	20.7	10.5	9.6	1.5	7.9	6.6	3	4.0	16.2	86	66	67	..	..	..	..	..
1057/1	1930-31	25-5-31	..	5.9	8.7	0.3	14.4	0	200	4.63	16.85	19.8	76.8	4.0	1,521	20.1	123.0	2.4	2,472	20.3	10.3	7.3	0.5	7.9	7.2	3	5.0	16.3	92	63	69	..	..	..	..	..
1057/2	..	..	..	5.9	8.8	0.4	14.6	6	200	4.72	16.85	20.1	78.8	3.2	1,584	20.2	119.4	2.3	2,412	20.7	9.8	9.8	1.0	7.7	7.5	3	4.7	16.0	92	63	66	..	..	..	..	..
706	1929-30	4-4-30	20B	..	..	..	..	2	191	4.94	17.98	19.8	83.8	4.0	1,659	20.0	128.0	3.3	2,560	20.1	11.2	8.6	0.5	8.1	6.4	3	3.6	17.3	88	62	65	..	..	..	..	..
1057/1	1930-31	26-5-31	..	..	..	..	..	11	198	4.63	17.98	19.5	82.4	4.5	1,607	19.9	132.2	3.7	2,631	19.5	11.4	7.9	0.5	8.3	8.0	3	5.7	17.4	91	65	69	..	..	..	..	..
1057/2	..	..	..	..	..	..	..	0	198	4.72	17.98	19.7	85.8	3.5	1,690	19.9	128.8	3.3	2,563	19.4	11.6	8.6	0.5	8.3	7.0	3	5.0	17.3	91	65	70	..	..	..	..	..
875	1927-28	24-4-28	26	..	..	..	..	7	171	5.78	20.23	25.4	65.5	4.3	1,664	..	..	..	..	25.4	9.4	9.9	2.5	6.7	8.0	3	6.5	19.7	90	64	68	..	..	..	..	..
124	1925-26	5-5-26	30	..	..	..	..	3	139	6.56	21.86	29.5	41.4	8.9	1,221	..	..	..	..	..	6.3	9.6	1.0	4.6	10.4	..	..	..	..	..	..	..	..	..	..
268	1926-27	7-7-27	..	..	..	..	..	11	158	6.62	21.86	29.4	56.1	4.1	1,649	..	..	..	..	29.9	8.0	10.0	2.5	6.5	7.4	2	4.1	21.1	85	80	80	..	..	..	..	..
375	1927-28	24-4-28	..	..	..	..	..	11	156	6.68	21.86	29.9	52.2	5.0	1,561	..	..	..	..	30.4	7.4	12.5	1.0	6.1	9.1	3	6.6	21.5	90	63	67	..	..	..	..	..
505	1928-29	30-4-29	..	..	..	..	..	26	158	6.67	21.86	29.5	43.5	5.1	1,283	29.8	63.0	5.0	1,877	30.4	5.8	11.7	4.2	5.7	10.6	5	7.7	20.8	91	66	68	..	..	..	..	..
706	1929-30	5-4-30	..	..	..	..	..	12	159	7.31	21.86	29.7	46.5	5.0	1,381	29.8	80.8	2.9	2,408	31.2	6.3	11.5	2.5	7.0	7.8	5	3.3	21.0	88	62	65	..	..	..	..	..
1057/1	1930-31	26-5-31	..	..	..	..	..	8	163	7.00	21.86	29.9	46.4	4.7	1,387	30.4	83.4	2.7	2,535	30.3	6.6	11.9	4.0	6.9	8.9	5	6.5	21.2	91	66	68	..	..	..	..	..
1057/2	..	..	..	..	..	..	..	16	163	7.03	21.86	30.0	48.0	5.3	1,440	30.7	80.8	2.4	2,481	30.4	6.6	11.3	3.0	6.7	11.4	5	6.2	21.2	91	66	70	..	..	..	..	..
5	1924-25	7-8-25	34	..	..	..	..	10	130	5.49	23.79	33.0	39.7	9.8	1,310	..	..	..	..	..	6.7	6.7	0	4.1	4.3	..	..	..	..	..	..	..	..	..	..	..
505	1928-29	1-5-29	..	..	..	..	..	34	147	7.58	23.26	33.5	35.0	4.6	1,203	33.8	52.8	4.3	1,778	34.4	4.9	12.6	4.0	5.1	11.8	7	7.4	22.4	91	67	70	..	..	..	..	..
706	1929-30	8-4-30	..	..	..	..	..	10	148	8.33	23.26	33.6	30.2	5.1	1,317	34.0	69.6	3.3	2,366	34.9	5.5	11.5	2.7	6.7	8.4	5	3.7	22.2	86	63	66	..	..	..	..	..
1057/1	1930-31	26-5-31	..	..	..	..	..	6	144	8.00	23.26	34.6	37.4	4.4	1,294	35.3	71.0	2.9	2,506	35.1	5.4	12.9	3.0	6.3	12.9	6	6.0	22.6	91	68	67	..	..	..	..	..
1057/2	..	..	..	..	..	..	..	20	144	8.03	23.26	34.1	38.7	5.2	1,320	34.9	71.2	2.4	2,485	34.0	5.7	12.3	3.0	6.2	11.7	5	6.2	22.3	91	68	68	..	..	..	..	..
50	1924-25	8-8-25	40	..	..	..	..	9	115	8.19	26.97	39.1	28.9	14.1	1,130	..	..	..	..	..	5.7	6.6	0	4.0	5.2	..	..	..	..	..	..	..	..	..	..	..
124	1925-26	5-5-26	..	..	..	..	..	4	113	8.77	26.97	39.0	26.4	12.1	1,030	..	..	..	..	..	4.3	13.6	0.5	3.8	13.3	..	..	..	..	..	..	..	..	..	..	..
268	1926-27	7-7-27	4	130	8.83	26.97	40.1	35.8	4.7	1,435	40.9	5.3	15.5	10.5	6.0	11.0	4	3.4	26.1	85	80	82

* Diameter of ring frame front roller— $\frac{7}{8}$ " ; Diameter of rings— $1\frac{1}{8}$ " ;

17.—NANDYAL 14.

Seasons ..	}	1923-24 (Sample No. 73).
		1924-25 (Sample No. 74).
		1925-26 (Sample No. 162).
		1926-27 (Sample No. 273).
		1927-28 (Sample No. 378).
		1928-29 (Sample No. 506).
		1929-30 (Sample No. 726).
		1930-31 (Sample No. 1044).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium indicum*.
- (ii) *History* :—From the commercial type known as "White Northern" selection work was begun at Nandyal in 1907-08; comparative trials were started in 1914-15, and general distribution of Nandyal 14 began in 1918.
- (iii) *District of growth* :—Nandyal (Kurnool district). The particular samples used in these tests have been grown on the Government Farm, Nandyal.
- (iv) *Growing period* :—Sown from the middle to the end of August, and picked from January to April.
- (v) *Soil* :—Stiff black cotton soil, slightly alkaline at Nandyal; but seed is distributed only for red and mixed soils of clay loams, for which it is better suited.
- (vi) *Rainfall* :—25-30 inches annually; a little over 20 inches in 1929-30, but well distributed so that the total return per acre was almost a record figure. The average rainfall in 1930-31 was also 29 inches but rains for sowing the crop and those during the north-east monsoon period were so ill-distributed that cotton cultivation during the year was of the nature of a gamble.
- (vii) *Temperature* :—Details not available.
- (viii) *Plant particulars* :—
- Bolls per plant: 27 (spacing: 18" x 9").
 - Seeds per boll: 21.
 - Weight of seed: 46 milligrammes.
 - Weight of lint per seed: 14 milligrammes.
 - Ginning percentage: 25.
- (ix) *Yield of seed-cotton* :—200 lbs. per acre in 1928-29. On the Agricultural station, the strain under comparative trials (spacing 24" x 9") during 1929-30, yielded 568 lbs. per acre, and in 1930-31 only 273 lbs. per acre.
- (x) *Area under cultivation* :—

1923-24	..	20,550	acres.
1924-25	..	20,180	"
1925-26	..	12,700	"
1926-27	..	17,730	"
1927-28	..	11,000	"
1928-29	..	23,600	"
1929-30	..	27,300	"

II. GRADER'S REPORT.

	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract under valued	Cambodia.	Cambodia.	Cambodia.	Northern.	F. G. Broach.	Broach.	Kumta	Broach.
Class	Fine	F.G. to Fine.	Fine to Superfine	Extra Superfine.	Fine.	Fine.	Extra superfine.	Superfine.
Colour	Creamy.	Creamy.	Slightly Creamy.	White.	White.	White.	White.	Reddish.
Staple Length	15/16 inch.	7/8-15/16 in.	7/8-1 inch.	1 inch.	1 inch.	7/8-1 inch.	1 1/16 inch.	15/16 inch.
Staple Strength	Good.	Good.	Good.	Good.	Good.	Good.	Fair.	Fair.
Regularity	Regular.	..	..	Good.	Regular.	Fair.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	..	Rs. 40 on.	Rs. 50 on.	Rs. 60 on.	Rs. 30 on.	Rs. 50 on.
Basis .. ..	..	..	..	Rs. 335.	Rs. 385.	Rs. 323.	Rs. 300.	Rs. 190.
Date of Valuation .. ..	..	..	..	..	7-5-28.	8-5-28.	24-5-30.	11-5-31.
Remarks .. ..	..	..	Silky cotton.	..	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29	Season 1929-30.	Season 1930-31.
2	0.1	..	..	..	0.5	0.1	0.5	..
3	1.3	1.5	1.5	1.2	2.1	1.1	1.3	2.0
4	2.9	3.0	3.2	2.7	4.4	2.4	2.6	4.1
5	6.2	6.6	6.8	5.4	8.0	5.7	6.0	9.0
6	12.0	12.9	13.1	9.6	14.0	10.2	12.0	18.6
7	26.5	32.2	27.4	22.1	23.5	22.1	24.8	35.3
8	37.4	32.7	33.9	34.8	33.5	36.7	33.7	24.8
9	12.6	9.6	11.6	20.8	11.9	18.7	13.1	5.6
10	1.0	1.5	2.5	3.4	2.1	2.9	4.4	0.6
11	..	..	..	..	..	0.1	1.6	..
2. Fibre-Length (inch)—								
(a) By Balls Sorter ..	0.90	0.89	0.90	0.94	0.89	0.93	0.92	0.85
(b) By Baer Sorter ..	0.91	0.89	0.87	0.93	0.87	0.90	0.91	0.88
3. Fibre-Weight per inch (millionth of an ounce)..								
	0.198	0.179	0.176	0.191	0.196	0.187	0.169	0.167
4. Fibre Strength (oz.)—								
(a) By Balls Tester ..	..	..	..	0.251	0.226	0.226	0.234	0.206
(b) By O'Neill Tester ..	..	..	..	0.195	0.233	0.247	0.231	0.213
5. Fibre-Strength per unit fibre weight per inch ..								
	..	..	..	1.17	1.17	1.26	1.38	1.25
6. Fibre-Rigidity (millionth of an ounce, square-inch)..								
	..	..	..	0.142	0.147	0.169	0.169	0.137
7. Ribbon-Width (thousandth of an inch) ..								
	0.74	0.66	0.70	0.61	0.67	0.65	0.65	0.67
8. Convolutions per inch ..								
	86	83	88	46	56	60	70	67

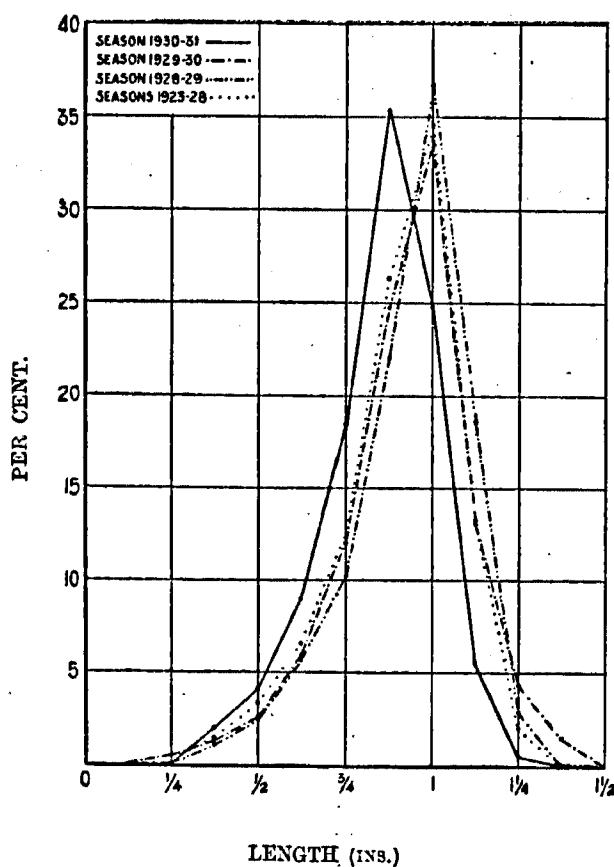


Fig. 17.—Sorter Diagrams for Nandyal 14—(Northern).

IV. SPINNING TESTS.

- i. *Treatment*:—1923-24, 1924-25, and 1926-27 (second lot) cottons: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1925-26 cotton and the first lot of the 1926-27 cotton were passed direct through the Crighton (twice); the 1927-28, 1928-29, 1929-30 and 1930-31 cottons were passed through the Lattice Feeder, but once only through the Crighton; in all other respects these samples were treated similarly to the 1923-24 cotton.
2. *Spinning Master's Report*:—
 - 1923-24 cotton: clean, but too creamy.
 - 1924-25 cotton: creamy, but too leafy.
 - 1925-26 cotton: creamy to creamy-white, leafy; too soft; very seedy indeed, with cut seed, gin nep, and unripe stuff present, giving a very neppy card web.
 - 1926-27 cotton: creamy-white; bright; silky feel; clean, but very seedy (3 per cent.).
 - 1927-28 cotton: creamy-white to creamy; bright, clean, with a soft and bodied feel; well-ginned, except for seed (one per cent.) which is mostly cut seed; a good sample.
 - 1928-29 cotton: white to creamy-white; very bright; perfectly clean; has a full-bodied feel; is well-ginned; a very desirable sample in every respect.
 - 1929-30 cotton: white; perfectly clean; very bright; has a good soft feel with plenty of cling and is well-ginned, except for a few partly ginned seeds; the staple is strong and regular in length; a very desirable cotton.
 - 1930-31 cotton: creamy-white; bright; has a good soft feel; very clean and, except for some cut and partly ginned seeds, well-ginned. The card web is very good, sliver clean and ten flat strips weigh 13·7 grams.
3. *Spinning Test Results*:—See Table 17, page 93.

V. REMARKS.

(i) *Fibre*.—With few exceptions the fibre-properties of this cotton are very nearly the same in each season. The fibre-length is rather low in 1930-31 and the ribbon-width and number of convolutions per inch are lowest in 1926-27 as compared with the other seasons.

(ii) *Waste*.—The blow-room loss of this cotton is rather variable, being exceptionally small in 1929-30, quite small in 1928-29 and 1930-31, and comparatively high in the three seasons 1924-27. The card-room loss is less variable, being usually about 8 per cent.

(iii) *Breakages*.—Yarn breakages in the ring frame are fairly numerous in 20's counts of the 1926-27 and 1929-30 samples, in 34's counts of 1927-28 and 1928-29, and in practically all counts of the 1930-31 cotton.

(iv) *Yarns*.—The yarns of this cotton vary with the season in evenness and, to a greater extent, in neppiness. Usually they are even in 20's and even to fairly even in 30's, but the yarns of 1928-29 and 1929-30 are more even while those of the two seasons 1924-26 are less even than usual. The yarns are almost free of nep in 1923-24 and 1929-30, decidedly neppy in 1925-26 and 1927-28 and rather neppy in the remaining seasons. The yarn-strength results do not show much variation, being best of all in 1929-30 and 1930-31 and worst in the two preceding seasons.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1923-24	..	34's.
1924-25	..	32's.
1925-26	..	32's.
1926-27	..	34's.
1927-28	..	31's.
1928-29	..	31's.
1929-30	..	35's.
1930-31	..	35's.

TABLE 17.—SPINNING TEST RESULTS FOR NANDYAL 14 (NORTHERNS).

HANK (1930-31).
 Draw-frame 0.18
 Slubber 0.76
 Inter 1.69
 Rover 4.68

TRAVELLER COUNTS.
 20 3/0
 30 7/0
 34 9/0

SPINDLE SPEED (1930-31).
 20A 9,400 r. p. m.
 20B 9,850 r. p. m.
 30 9,800 r. p. m.
 34 9,500 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour	Front Roller Speed R.P.M.	Draft.	Turns per inch	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.).	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch lbs.).	Work Irregularity %.	Count-Work Product.	Counts.	Strength (ozs).	Strength Irregularity (%).	Weakness Percentage.		Extension (%).	Extension Irregularity (%).				Evenness Class.	Neps per Yard.	Turns per inch actual.
73	1923-24	2-11-25	20A	5.0	7.5	0.9	13.7	10	182	4.35	16.85	19.3	93.5	6.0	1,805	..	..	..	..	13.8	11.2	3.2	5.9	9.5	3	1.0	..	84	73	57	
74	1924-25	11-11-25	"	8.2	8.1	0.5	16.1	27	180	4.33	16.85	19.2	96.9	7.4	1,800	..	..	..	..	10.8	11.0	5.8	3.3	19.0	4	3.0	..	83	82	56	
102	1925-26	6-8-20	"	8.6	8.9	1.0	17.6	22	179	4.27	16.85	19.8	77.2	8.8	1,529	..	..	..	..	11.8	7.7	1.5	5.9	6.5	4	0.7	..	87	79	80	
273	1926-27	22-7-27	"	8.5	8.6	0.5	16.8	30	189	4.55	16.85	19.9	88.7	6.5	1,765	..	..	..	..	19.9	12.4	10.3	1.7	6.7	6.3	3	4.0	16.3	84	80	72
378	1927-28	27-4-28	"	7.3	8.7	0.4	15.7	10	192	4.52	16.85	19.6	81.9	9.6	1,605	..	..	..	..	20.5	10.9	12.8	6.0	6.4	8.0	3	7.1	16.2	90	67	69
506	1928-29	2-5-20	"	4.8	8.0	0.3	12.7	17	192	4.35	16.85	20.2	79.7	7.4	1,610	20.5	142.3	3.5	2917	20.9	11.5	13.1	6.0	6.0	7.2	2	4.1	16.2	91	66	70	
726	1929-30	5-5-30	"	2.6	7.0	0.6	10.0	40	202	4.73	16.85	20.0	90.1	6.9	1,802	20.2	140.4	3.4	2836	20.2	12.7	12.9	3.7	6.6	8.3	2	2.0	16.2	92	63	63	
1044/1	1930-31	5-5-31	"	5.0	7.6	0.4	12.6	17	197	4.44	16.85	19.5	94.8	5.3	1,840	20.0	151.6	4.0	3032	19.8	12.6	10.1	0	6.3	7.9	2	4.5	16.4	91	66	69	
1044/2	"	"	"	5.6	7.6	0.5	13.3	6	107	4.44	16.85	20.1	88.6	6.3	1,781	20.5	139.2	2.9	2854	20.7	11.0	14.0	7.5	6.3	8.5	3	3.7	16.1	91	66	69	
726	1929-30	5-5-30	20B	..	..	..	..	2	200	4.73	17.98	19.8	105.6	4.9	2,089	20.0	147.6	4.5	2952	20.6	13.3	9.5	1.5	6.7	7.0	2	1.3	17.3	92	61	62
1044/1	1930-31	5-5-31	"	..	..	..	..	40	193	4.44	17.98	19.7	106.5	4.6	2,098	20.1	159.2	4.4	3200	20.4	13.2	10.8	0	6.3	7.5	3	4.5	17.4	90	68	69
1044/2	"	"	"	..	..	..	..	29	193	4.44	17.98	20.0	101.1	5.5	2,022	19.9	158.2	5.0	3148	19.8	13.3	12.5	5.0	6.8	6.6	3	4.2	17.2	90	68	70
73	1923-24	3-11-25	30	..	..	..	..	21	142	6.53	21.86	29.1	64.1	5.8	1,574	..	..	..	..	8.8	9.8	2.4	5.1	9.1	5	1.6	..	83	73	58	
74	1924-25	12-11-25	"	..	..	..	..	3	141	6.72	21.86	29.3	52.2	6.9	1,529	..	..	..	..	7.3	11.8	5.7	2.0	20.4	6	3.7	..	81	81	54	
102	1925-26	7-8-20	"	..	..	..	..	18	139	6.31	21.86	29.2	52.5	7.8	1,533	..	..	..	..	7.5	10.6	1.5	5.4	8.4	5	6.5	..	87	77	81	
273	1926-27	23-7-27	"	..	..	..	..	16	160	6.69	21.86	30.1	54.0	7.8	1,625	..	..	..	..	30.6	7.7	12.8	4.5	6.0	7.9	4	4.5	21.1	84	80	72
378	1927-28	28-4-28	"	..	..	..	..	15	158	6.78	21.86	29.5	50.2	9.8	1,481	..	..	..	..	30.3	7.4	17.2	11.0	5.5	13.5	4	7.2	21.4	90	63	69
506	1928-29	2-5-29	"	..	..	..	..	12	155	6.25	21.86	29.0	49.4	9.5	1,477	30.6	80.6	5.0	2466	30.4	8.2	12.3	4.7	6.2	9.2	4	3.6	21.0	92	63	68
726	1929-30	6-5-30	"	..	..	..	..	6	162	7.05	21.86	29.6	55.2	7.3	1,634	29.7	94.3	3.0	2801	30.5	7.8	12.1	5.0	5.4	11.6	4	2.4	21.0	91	62	64
1044/1	1930-31	6-5-31	"	..	..	..	..	29	162	6.67	21.86	30.5	54.1	4.9	1,650	30.7	95.4	2.9	2920	31.1	7.6	11.0	3.0	5.1	15.0	4	4.0	21.2	91	68	67
1044/2	"	"	"	..	..	..	..	44	162	6.50	21.86	29.9	57.1	4.7	1,707	31.1	92.2	2.1	2867	30.2	7.8	15.0	9.5	5.4	13.8	4	3.7	21.1	91	68	70
378	1927-28	30-4-28	34	..	..	..	..	23	143	7.73	23.26	33.5	40.4	10.4	1,353	..	..	..	..	31.4	6.3	16.6	10.5	5.4	12.7	5	8.2	22.5	91	70	69
506	1928-29	3-5-29	"	..	..	..	..	33	147	7.11	23.26	33.6	41.6	8.5	1,398	33.3	71.3	4.4	2374	34.2	6.9	12.6	4.5	5.8	10.8	5	4.6	22.4	92	67	69
726	1929-30	6-5-30	"	..	..	..	..	20	148	7.81	23.26	32.8	47.9	7.7	1,571	33.7	82.7	3.4	2787	33.5	7.1	13.4	5.7	5.1	12.9	5	2.7	22.5	92	63	63
1044/1	1930-31	7-5-31	"	..	..	..	..	31	146	7.42	23.26	33.9	46.5	6.3	1,576	34.3	85.0	2.5	2915	33.8	6.7	16.6	10.0	4.6	19.5	5	3.7	22.5	91	70	70
1044/2	"	"	"	..	..	..	..	46	146	7.17	23.26	33.4	46.3	6.3	1,546	34.4	82.6	2.9	2841	34.1	6.5	13.9	7.5	5.0	15.6	5	4.5	22.3	91	70	71
73	1923-24	8-11-25	40	..	..	..	..	20	114	8.74	26.97	39.3	35.2	7.7	1,383	..	..	..	..	6.4	12.1	6.4	4.2	14.6	7	1.9	..	83	73	66	
74	1924-25	13-11-25	"	..	..	..	..	7	114	8.98	26.97	38.7	33.6	7.6	1,300	..	..	..	..	5.2	13.7	6.8	3.4	18.4	8	2.5	..	82	83	63	
102	1925-26	9-9-26	"	..	..	..	..	23	113	8.55	26.97	39.8	34.7	9.4	1,381	..	..	..	..	5.7	11.1	2.7	4.8	8.6	7	6.7	..	85	81	61	
273	1926-27	25-7-27	"	..	..	..	..	31	131	8.86	26.97	39.6	38.8	7.5	1,536	..	..	..	..	40.5	5.6	13.8	8.2	5.4	10.1	5	3.9	25.8	83	80	74

* Diameter of ring frame front roller— $\frac{3}{8}$ ". Diameter of rings— $1\frac{1}{8}$ ".

18.—HAGARI 1.

Seasons ..	{	1924-25 (Sample No. 65).
		1925-26 (Sample No. 140).
		1926-27 (Sample No. 255).
		1928-29 (Sample No. 507).
		1929-30 (Sample No. 736).
		1930-31 (Sample No. 1031).

I. AGRICULTURAL DETAILS.

- (d) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—A pure strain obtained by further selection from within the strain Westerns Hagari 25 at the Agricultural Station, Hagari, Bellary district. Comparative trials were started in 1925-26 and general distribution of Hagari 1 began in 1926-27.
- (iii) *District of growth* :—Parts of Bellary district. The particular samples used in these tests have been grown at the Agricultural Station, Hagari.
- (iv) *Growing period* :—Sown from the last week in August to the first week in September and picked from the last week in February to the middle of April.
- (v) *Soil* :—Stiff black cotton soil.
- (vi) *Rainfall* :—23 inches annually.
- (vii) *Temperature* :—Varying from 56°F to 106°F from Feb. to April.
- (viii) *Plant particulars* :—
- Bolls per plant : 25 (spacing : 30" × 24").
 - Seeds per boll : 19.
 - Weight of seed : 58 milligrammes.
 - Weight of lint per seed : 24 milligrammes.
 - Ginning percentage : 29.
- (ix) *Yield of seed-cotton* :—276 lbs. per acre (Hagari Experimental Station, 1924-30).
- (x) *Area under cultivation* :—
- | | | |
|---------|----|--------------|
| 1927-28 | .. | 4,300 acres. |
| 1928-29 | .. | 50,700 ,, |
| 1929-30 | .. | 160,300 ,, |

II. GRADER'S REPORT.

	Season 1924-25	Season 1925-26	Season 1926-27	Season 1928-29	Season 1929-30	Season 1930-31
Contract valued under	Cambodia	C. P. No.1	Broach	Broach	Broach
Class	Fine to Superfine	Superfine	Superfine	Extra Superfine	Superfine
Colour	Creamy	White	White	White	White
Staple Length	3/4-7/8 inch	13/16 inch	3/4-7/8 inch	7/8 inch	One inch
Staple Strength..	..	Poor.	Fair	Good	Good	Good
Regularity	Irregular	Fair	Good	Fair	Fair
Value above or below contract rate	Rs. 15 on	Rs. 45 on	Rs. 50 on	Rs. 60 on
Basis	Rs. 315	Rs. 223	Rs. 200	Rs. 180
Date of Valuation	17-5-27	8-5-29	24-5-30	24-5-31
Remarks	Thin	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.					
	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	..	..	0.4	0.4	..	..
3	1.6	1.8	2.1	2.1	1.6	1.1
4	3.1	3.9	4.3	4.0	3.8	2.0
5	6.9	9.1	10.9	9.0	10.8	4.9
6	20.8	21.6	29.3	18.9	21.9	13.7
7	34.4	43.0	35.0	33.7	33.8	32.4
8	22.9	17.7	11.7	24.6	21.0	31.3
9	8.3	2.9	3.3	6.3	5.7	11.6
10	1.4	..	..	1.0	1.4	3.0
11	0.6	..	..	..	..	..

2. Fibre-Length (inch):						
(a) By Balls Sorter	0.87	0.83	0.81	0.85	0.84	0.91
(b) By Baer Sorter	0.86	0.82	0.82	0.84	0.84	0.91
3. Fibre-Weight per inch (millionth of an ounce)	0.171	0.146	0.209	0.207	0.175	0.166
4. Fibre-Strength (oz.):						
(a) By Balls Tester .. ..	..	..	..	0.140	0.128	0.161
(b) By O'Neill Tester .. ..	..	..	..	0.140	0.128	0.150
5. Fibre-Strength per unit fibre-weight per inch .. ..	..	..	..	0.6	0.73	0.94
6. Fibre-Rigidity (millionth of an ounce, square-inch) .. ..	..	..	..	0.164	0.129	0.128
7. Ribbon-Width (thousandth of an inch) .. ..	..	..	..	0.65	0.71	0.66
8. Convolutions per inch .. ..	..	..	..	78	88	74

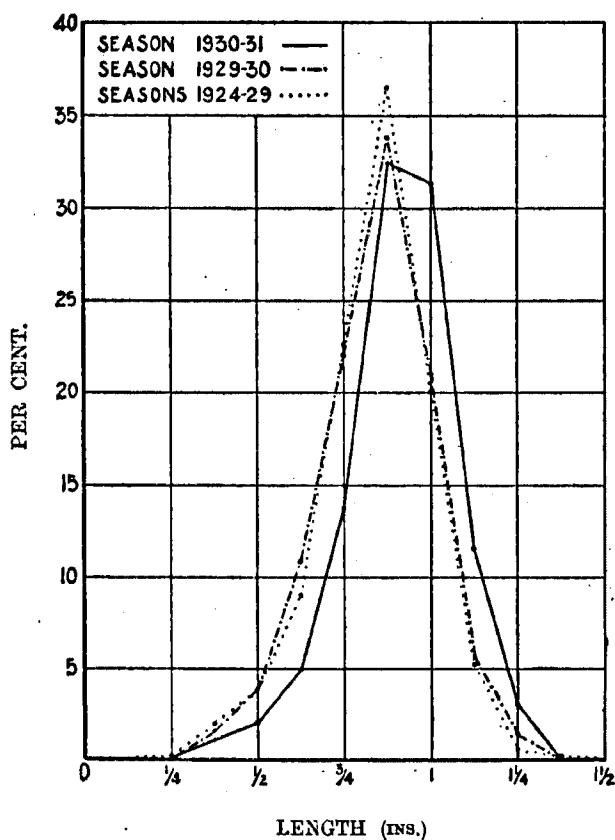


FIG. 13.—Sorter Digrams for Ha gari 1—(Westerns).

IV. SPINNING TESTS.

1. *Treatment*:—Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1924-25 sample was first passed through Lattice Feeder and twice through the Crighton; the 1928-29, 1929-30 and 1930-31 samples were passed only once through the Crighton after passing through the Lattice Feeder; otherwise the treatment was the same as for the cottons of the other seasons.
2. *Spinning Master's Report*:—
 - 1924-25 cotton: clean and silky, but much too soft.
 - 1925-26 cotton: white; bright; very clean; much too soft.
 - 1926-27 cotton: whitish; bright; very clean; practically no leaf or stain; well-ginned.
 - 1928-29 cotton: white to creamy-white; very clean; it has a full-bodied feel; well-ginned; staple is fairly regular and fairly strong. A very good sample indeed.
 - 1929-30 cotton: white to creamy-white; bright; perfectly clean; has a soft and bodied feel; very well-ginned. The staple is somewhat irregular in length but of good strength. Card web is even and clear, and sliver clean; ten full sized flat strips weighed 11.25 grams.
 - 1930-31 cotton: white; very bright; perfectly clean; has a full-bodied feel; well-ginned; the card web is first class, sliver perfectly clean and ten flat strips weigh 6 grams. The cotton loss (blow-room and the card) of this sample is the lowest so far recorded in the Laboratory.
3. *Spinning Test Results*:—See Table 18, page 97.

V. REMARKS.

(i) *Fibre*.—Only the fibre-length and fibre-weight per unit length were measured in the seasons previous to 1928-29 and these show a fair amount of seasonal variation. The fibre-length is rather low in 1925-26 and 1926-27 and high in 1930-31. The fibre-weight per inch is very low in 1925-26 and comparatively high in the following seasons. The fibre-strength and fibre-strength per unit fibre-weight are both high in 1930-31.

(ii) *Waste*.—This is a very clean cotton as will be seen from the exceptionally low values for blow-room loss, which is, at the most, 4.5 per cent. in 1924-25 and only 1.6 per cent. in 1930-31. The card-room loss is also low, especially in 1930-31.

(iii) *Breakages*.—Yarn breakages in the ring frame are comparatively few in all cases, except for 20's and 26's of 1928-29 and for 20's of 1929-30.

(iv) *Yarns*.—The yarns of this cotton vary in evenness with the season. The 20'sA yarns are very even in 1926-27, very even to even in the following season, and even in the other seasons. The yarns are practically free from neppiness in all seasons except 1925-26 and 1929-30. The yarn-strength results are subject to seasonal variation being rather poor in 1928-29 and very much better in 1930-31.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1924-25	..	30's.
1925-26	..	30's.
1926-27	..	27's.
1927-28	..	(Not sent for test).
1928-29	..	24's.
1929-30	..	27's.
1930-31	..	36's.

TABLE 18.—SPINNING TEST RESULTS FOR HAGARI 1.
TRAVELLER COUNTS.

SPINDLE SPEED (1930-31)

20A .. 9350 r.p.m.
20B .. 9650 r.p.m.
30^s .. 9700 r.p.m.
40^s .. 9700 r.p.m.

HANK (1930-31)
Draw-frame .. 0.18
Slubber .. 0.78
Inter .. 1.66
Rover .. 4.78

20^s .. 3/0
30^s .. 7/0
40^s .. 12/0

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS. *				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).					Evenness Class.	Neps per yard.	Turns per Inch Actual.
65	1924-25	24-9-25	20A	4.5	10.2	0.5	14.6	5	183	4.49	16.85	19.6	83.1	4.8	1,625	..	..	..	..	..	12.3	8.9	1.4	4.7	12.3	..	..	..	85	79	60
140	1925-26	10-6-26	"	4.4	11.1	0.6	15.4	17	181	4.30	16.85	19.1	87.1	5.0	1,664	..	..	..	..	..	11.6	8.1	0	5.9	8.7	3	3.7	..	92	67	65
255	1926-27	20-6-27	"	2.6	7.7	0.3	10.4	12	190	4.30	16.85	19.2	83.4	5.2	1,601	..	..	..	..	19.3	11.6	12.0	4.0	7.6	7.1	1	0.6	16.3	86	79	81
507	1928-29	3-5-29	"	3.9	6.9	0.2	10.8	35	191	4.44	16.85	19.6	66.7	4.9	1,307	20.0	110.4	3.7	2,208	20.1	19.1	13.2	6.0	7.0	7.3	2	0.8	16.3	92	69	79	
736	1929-30	21-5-30	"	3.2	6.8	0.4	10.1	42	200	4.30	16.85	19.4	81.0	7.1	1,571	19.7	130.2	3.2	2,565	20.1	11.8	9.8	0.7	8.0	7.8	3	2.8	16.2	91	62	66	
1031/1	1930-31	24-4-31	"	1.6	4.8	0.5	6.7	7	198	4.55	16.85	20.3	90.2	5.0	1,831	20.5	136.6	4.4	2,800	21.1	11.6	10.3	2.0	6.7	6.2	2	0.7	16.2	91	68	67	
1031/2	"	"	"	1.7	5.3	0.3	7.2	0	198	4.55	16.85	19.6	98.1	4.3	1,923	20.2	138.6	4.0	2,800	20.8	12.1	9.3	1.0	6.7	8.1	3	0.7	16.0	91	68	69	
255	1926-27	21-6-27	20B	..	..	..	..	7	192	4.49	17.98	19.5	86.6	4.6	1,689	..	..	..	..	19.6	12.3	11.0	2.0	7.6	8.1	1	1.1	17.4	86	77	83
507	1928-29	4-5-29	"	..	..	..	..	17	190	4.47	17.98	19.4	79.8	5.6	1,548	10.7	120.3	3.6	2,370	19.8	11.2	8.0	0.7	7.2	6.4	2	1.1	17.0	93	72	73
736	1929-30	21-5-30	"	..	..	..	..	22	195	4.35	17.98	19.5	86.5	4.4	1,637	19.8	134.5	3.6	2,663	20.0	12.8	9.6	1.0	8.3	6.7	4	3.2	17.3	92	61	67
1031/1	1930-31	24-4-31	"	..	..	..	..	47	197	4.55	17.98	20.2	97.1	6.0	1,961	20.3	151.4	4.7	3,073	20.5	13.5	8.7	1.5	7.2	6.7	3	1.2	17.3	90	67	68
1031/2	"	"	"	..	..	..	..	7	197	4.55	17.98	19.9	98.0	4.8	1,950	20.3	143.0	3.0	2,903	20.5	13.1	9.8	2.0	7.1	9.8	3	0.7	17.2	90	67	70
507	1928-29	6-5-29	26	..	..	..	..	29	172	5.90	20.23	25.9	48.6	5.4	1,259	25.8	79.8	4.2	2,059	26.0	7.8	11.9	4.2	6.6	7.2	4	0.8	19.4	63	64	69
736	1929-30	22-5-30	"	..	..	..	..	14	172	5.71	20.23	25.6	57.3	5.5	1,467	25.9	95.8	2.5	2,481	26.1	8.9	11.2	4.2	7.4	8.5	5	2.7	19.5	91	61	66
65	1924-25	25-9-25	30	..	..	..	..	1	142	6.66	21.86	30.0	45.5	8.0	1,305	..	..	..	..	..	7.9	10.2	2.8	3.8	11.6	..	..	..	86	84	55
140	1925-26	11-6-26	"	..	..	..	..	3	140	6.67	21.86	29.2	51.1	6.3	1,492	..	..	..	..	..	6.9	10.0	2.5	4.8	10.7	5	3.5	..	91	68	71
255	1926-27	21-6-27	"	..	..	..	..	10	157	6.42	21.86	28.1	49.3	6.1	1,385	..	..	..	..	28.9	7.4	12.4	3.0	6.7	9.4	4	0.7	21.3	87	75	81
1031/1	1930-31	25-4-31	"	..	..	..	..	18	161	6.72	21.86	29.7	55.6	5.6	1,651	30.9	90.4	2.2	2,793	31.4	7.4	11.3	1.0	5.7	9.4	4	1.2	20.8	91	68	68
1031/2	"	"	"	..	..	..	..	4	161	6.90	21.86	30.2	54.9	6.6	1,658	30.8	88.6	2.2	2,729	30.7	7.8	11.6	5.5	6.0	12.3	4	1.5	21.1	91	68	69
65	1924-25	25-9-25	40	..	..	..	..	1	115	8.82	26.97	39.8	31.3	8.5	1,246	..	..	..	..	..	5.9	11.6	4.2	3.5	19.4	..	..	..	86	84	54
140	1925-26	11-6-26	"	..	..	..	..	6	113	8.83	26.97	38.5	33.3	5.0	1,232	..	..	..	..	..	5.2	9.9	3.5	4.1	11.0	6	4.7	..	91	67	72
1031/1	1930-31	25-4-31	"	..	..	..	..	23	131	9.14	26.97	40.2	34.7	6.1	1,395	41.4	68.8	3.1	2,848	41.8	5.3	11.1	6.5	5.3	13.3	5	1.2	25.8	91	66	67
1031/2	"	"	"	..	..	..	..	23	131	9.14	26.97	39.4	36.2	4.8	1,426	40.5	68.4	2.2	2,770	40.3	5.3	14.9	11.5	5.0	19.7	6	1.0	25.4	91	66	69

* Diameter of ring frame front roller— $\frac{7}{8}$ ". Diameter of rings— $1\frac{1}{2}$ ".

19.—HAGARI 25.

Seasons ..	{	1923-24 (Sample No. 75).
		1924-25 (Sample No. 76).
		1925-26 (Sample No. 163).
		1926-27 (Sample No. 269).
		1927-28 (Sample No. 377).
		1928-29 (Sample No. 508).
		1929-30 (Sample No. 737).
	}	1930-31 (Sample No. 1032).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—From the local main season Westerns cotton, selection work was begun at Hagari in 1909; comparative trials were started in 1914-15, and general distribution of Hagari 25 began in 1917-18.
- (iii) *District of growth* :—Hagari (Bellary district). The particular samples used in these tests have been grown on the Government Farm, Hagari.
- (iv) *Growing period* :—Sown from the last week in August to the first week in September, and picked from the last week in February to the middle of April.
- (v) *Soil* :—Stiff black cotton soil.
- (vi) *Rainfall* :—23 inches annually.
- (vii) *Temperature* :—Varying from 56° F to 106° F from February to April.
- (viii) *Plant particulars* :—
- (a) Bolls per plant : 21 (spacing : 30" × 24").
- (b) Seeds per boll : 19.
- (c) Weight of seed : 52 milligrammes.
- (d) Weight of lint per seed : 18 milligrammes.
- (e) Ginning percentage : 25.
- (ix) *Yield of seed-cotton* :—238 lbs. per acre (Hagari Experimental Station 1924-30).
- (x) *Area under cultivation* :—

1923-24	..	81,100 acres.
1924-25	..	180,570 "
1925-26	..	179,363 "
1926-27	..	157,686 "
1927-28	..	129,452 "
1928-29	..	121,374 "

This cotton is being displaced by Hagari I owing to the fact that the yield of the two cottons is similar, and their quality appears to be similar, but the ginning percentage of Hagari I is higher than that of Hagari 25.

II. GRADER'S REPORT.

	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
Contract valued under Class	Westerns. F.G. to Fine	Westerns. † Fine	Kumpta Fine	Northern. Fine.	F. G. Broach. Fine.	Broach. Superfine.	Broach. Extra. superfine	Broach. Superfine.
Colour	Tinged	Creamy.	Creamy.	Creamy.	Brownish.	White.	White	Slightly tinged.
Staple Length	5/8-13/16 inch.	11/16-7/8 inch.	3/4 inch	3/4 inch.	7/8 inch.	7/8-1 inch.	15/16 in.	One inch.
Staple Strength	Good.	Good.	Fair.	[Poor Fair.	Good.	Good.	Fair.	(Good. Fair.
Regularity .. ..	..	..	Fair.	Fair.	Regular.	Good.	Fair.	Fair.
Value above or below contract rate .. ..	..	..	..	Rs. 10 off.	Rs. 20 on.	Rs. 60 on.	Rs. 45 on.	Rs. 50 on.
Basis .. ..	..	..	..	Rs. 335.	Rs. 385.	Rs. 323.	Rs. 260.	Rs. 180.
Date of Valuation .. ..	..	..	..	..	7-5-28.	8-5-29.	24-5-30.	28-4-31.
Remarks .. ..	..	..	..	Poor staple	..	..	..	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	Season 1923-24.	Season 1924-25.	Season 1925-26.	Season 1926-27.	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.2	..	0.3	0.2	0.6	0.4	0.5	..
3	1.7	1.5	1.6	2.0	2.4	1.8	1.5	1.5
4	3.2	3.7	3.6	6.4	4.1	2.9	3.3	2.8
5	7.1	8.7	9.6	16.9	8.5	7.0	8.9	6.3
6	14.5	20.6	20.8	33.9	16.4	14.6	19.8	15.0
7	25.8	35.9	35.5	28.8	29.7	25.4	33.6	31.7
8	28.1	21.6	20.1	9.6	26.7	34.0	23.4	27.9
9	14.7	6.8	6.8	2.2	9.5	11.5	7.4	11.0
10	4.1	1.2	1.7	..	2.0	2.4	1.6	3.8
11	0.6	..	..	..	0.1	..	..	..
2. Fibre-Length (inch).—								
(a) By Balls Sorter	0.91	0.86	0.85	0.77	0.86	0.90	0.86	0.90
(b) By Baer Sorter	0.90	0.87	0.85	0.75	0.89	0.90	0.86	0.91
3. Fibre-Weight per inch (millionth of an ounce)								
	0.210	0.172	0.178	0.177	0.205	0.188	0.178	0.195
4. Fibre-Strength (oz.):—								
(a) By Balls Tester	0.176	0.157	0.112	0.111	0.148	0.134	0.136	0.151
(b) By O'Neill Tester	0.147	0.151	0.128	0.109	0.122	0.130	0.137	0.147
5. Fibre-Strength per unit fibre-weight per inch								
	0.77	0.90	0.67	0.62	0.66	0.70	0.77	0.76
6. Fibre-Rigidity (millionth of an ounce, square-inch)								
	0.121	0.108	0.102	0.097	0.112	0.098	0.128	0.128
7. Ribbon-Width (thousandth of an inch).								
	0.70	0.66	0.69	0.65	0.70	0.65	0.66	0.68
8. Convolutions per inch								
	84	91	94	54	76	75	63	75

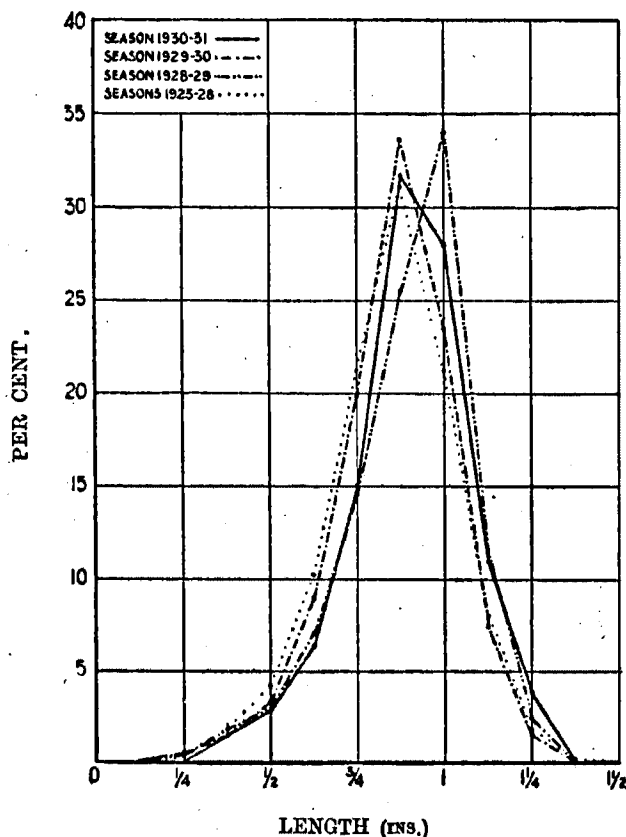


Fig. 19.—Sorter Diagrams for Hagari 25—(Westerns).

IV. SPINNING TESTS.

1. *Treatment*:—1923-24 and 1924-25 cottons: Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The Lattice Feeder treatment was omitted for the 1925-26 cotton, and all the samples since 1926-27 were passed through the Crighton once only; otherwise all the cottons were treated similarly to the 1923-24 and 1924-25 cottons.
2. *Spinning Master's Report*:—
 - 1923-24 cotton: a trifle stained and seedy: contains far too much fine leaf and husk.
 - 1924-25 cotton: clean; creamy; has a silky feel.
 - 1925-26 cotton: creamy to creamy-white; a little leafy and seedy; the gin has cut the seeds and nepped the cotton.
 - 1926-27 cotton: creamy; bright; clean, with a little fine leaf; dropped a lot of short fibre in the blow-room and card.
 - 1927-28 cotton: creamy-white to creamy; trifle dull; fairly clean; has a good feel; well-ginned.
 - 1928-29 cotton: white to creamy-white; fairly bright; very clean; it has a good feel; contains 1.5 per cent. full size ginned seeds but is well-ginned; staple is regular, fine, and strong.
 - 1929-30 cotton: clean; bright; creamy; has a soft silky feel; well-ginned except for cut seed; staple fine and strong, and very regular in length; card web good; sliver clean and flat strips light, weighing 10.1 grams for ten strips.
 - 1930-31 cotton: white to creamy-white; fairly bright; perfectly clean; well-ginned; has a good-bodied feel; the card web is good, sliver very clean and ten flat strips weigh 5.9 grams only.
3. *Spinning Test Results*:—See Table 19, page 101.

V. REMARKS.

(i) *Fibre*.—The fibre-properties of this cotton exhibit fairly large seasonal fluctuation. The fibre-length is very low in 1926-27 and comparatively high in 1923-24 and 1930-31. The fibre-weight per inch is low in the three seasons 1924-27. The fibre-strength, the fibre-rigidity, and the number of convolutions per inch are all low for the 1926-27 cotton.

(ii) *Waste*.—The blow-room loss is exceptionally low in 1930-31 and quite low in all other seasons except 1923-24. The card-room loss is usually about 8 per cent., but is considerably higher than usual in 1928-29 and low in 1930-31.

(iii) *Breakages*.—Yarn-breakages in the ring-frame are few in all cases except 30's and 34's counts of the 1926-27 cotton.

(iv) *Yarns*.—The yarns of this cotton are usually even in 20's and fairly even in 30's counts, those of the 1928-29 and 1930-31 cottons being distinctly better than the others in this respect. This cotton usually gives practically nep-free yarns but the 1925-26 and 1926-27 samples are exceptions. The yarn-strength results, which show a little variation upto 1929-30, are much better in 1930-31 than ever before.

(v) *Conclusion*.—In every respect the two Hagari cottons of this season are remarkable improvements over their predecessors. Their staple is appreciably longer and stronger, their blow-room loss is practically negligible, the card-room loss is very small and the yarns spun have given such good yarn-strength results as to raise these cottons from 30's into 40's class.

The following are the highest standard warp counts for which this cotton is suitable in the different seasons:—

1923-24	..	25's.
1924-25	..	28's.
1925-26	..	26's.
1926-27	..	26's.
1927-28	..	26's.
1928-29	..	30's.
1929-30	..	25's.
1930-31	..	36's.

TABLE 19.—SPINNING TEST RESULTS FOR HAGARI 25.

HANK (1930-31).

Draw-frame	0.17
Slubber	0.75
Inter	1.65
Rover	4.67

TRAVELLER COUNTS.

20 ^s	3/0
30 ^s	7/0
40 ^s	12/0

SPINDLE SPEED (1930-31).

20 ^s A	9,400 r.p.m.
20 ^s B	9,650 r.p.m.
30 ^s	9,700 r.p.m.
40 ^s	9,750 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakage per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (Inch. lbs.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).					Evenness Class.		
																															Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per Inch actual.
75	1923-24	13-11-25	20A	9.8	8.1	0.0	17.8	7	183	4.35	16.85	19.1	75.0	10.4	1,432	..	..	..	..	..	11.8	9.4	0.2	4.5	11.0	3	1.9	..	82	82	53
76	1924-25	10-11-25	"	5.4	7.1	0.4	12.3	12	183	4.44	16.85	19.5	87.4	5.9	1,704	..	..	..	..	..	11.0	8.1	1.0	4.7	12.6	3	1.5	..	80	72	63
163	1925-26	9-8-26	"	5.5	8.8	0.4	14.2	20	180	4.30	16.85	19.8	75.0	6.4	1,485	..	..	..	..	..	10.6	10.4	1.2	6.0	10.2	3	6.0	..	85	82	78
269	1926-27	8-7-27	"	5.1	8.6	0.6	13.7	14	193	4.44	16.85	20.0	75.4	6.5	1,508	..	..	..	..	..	20.3	10.6	3.2	6.6	8.9	3	4.0	16.3	85	80	77
377	1927-28	26-4-28	"	5.9	8.3	0.3	13.8	15	190	4.55	16.85	19.3	78.8	4.9	1,521	19.6	10.6	12.7	6.5	6.7	8.9	3	1.6	16.3	89	67	69
508	1928-29	6-5-29	"	5.5	13.2	0.5	18.3	7	194	4.70	16.85	19.3	93.5	3.0	1,804	20.2	130.7	5.8	2,640	20.0	11.8	10.5	3.2	7.3	7.9	2	2.2	16.4	91	62	70	
737	1929-30	22-5-30	"	5.1	6.4	0.2	11.4	17	188	4.44	16.85	10.3	75.1	5.5	1,440	19.8	139.0	3.5	2,752	20.1	10.4	10.0	1.2	7.1	6.8	3	2.7	16.3	91	61	66	
1032/1	1930-31	27-4-31	"	1.2	5.2	0.5	6.0	0	198	4.44	16.85	19.6	94.6	4.0	1,854	19.8	135.0	3.0	2,873	20.6	11.4	10.8	2.5	7.1	7.9	2	0.7	16.1	89	60	63	
1032/2	"	"	"	1.9	5.5	0.3	7.6	0	198	4.35	16.85	19.8	93.9	4.2	1,859	20.4	132.2	2.5	2,697	20.2	12.3	10.3	0	7.7	5.8	2	1.2	16.3	89	60	63	
737	1929-30	22-5-30	20H	..	..	..	..	15	197	4.55	17.98	19.6	77.9	5.1	1,527	20.0	121.2	3.5	2,424	20.8	10.3	11.7	3.5	6.9	8.6	3	2.6	17.2	91	63	66
1032/1	1930-31	27-4-31	"	..	..	..	..	15	198	4.44	17.98	10.7	96.3	3.8	1,897	19.9	141.6	5.9	2,818	21.0	12.0	8.3	1.5	7.4	9.2	2	0.7	17.2	89	60	68
1032/2	"	"	"	..	..	..	..	5	198	4.44	17.98	19.4	101.1	3.6	1,961	19.6	154.6	3.5	3,030	19.5	13.9	7.8	0	8.2	5.4	2	1.0	17.4	89	60	68
877	1927-28	26-4-28	26	13	169	6.08	20.23	26.0	55.0	6.0	1,430	26.3	7.4	10.6	2.2	5.8	9.4	4	2.5	19.9	89	66	71
737	1929-30	23-5-30	"	..	..	..	..	5	170	5.81	20.23	25.2	54.5	5.2	1,373	25.4	93.5	2.4	2,375	25.7	7.7	11.4	3.2	6.1	8.5	4	2.6	19.4	91	61	65
75	1923-24	14-11-25	30	..	..	..	..	1	140	6.61	21.86	29.1	44.6	7.1	1,298	..	..	..	..	..	7.3	8.4	0.2	3.9	10.4	4	1.4	..	83	81	55
76	1924-25	23-11-25	"	..	..	..	..	7	142	6.55	21.86	29.3	46.8	5.5	1,371	..	..	..	..	..	7.2	11.0	4.7	3.8	17.0	5	1.7	..	80	72	58
163	1925-26	10-8-26	"	..	..	..	..	10	139	6.45	21.86	29.7	46.2	6.2	1,372	..	..	..	..	..	6.7	12.6	6.0	4.5	12.2	5	4.9	..	85	83	77
269	1926-27	11-7-27	"	28	156	6.49	21.86	29.4	47.7	4.9	1,402	29.0	7.3	14.1	2.7	5.8	10.7	5	3.9	21.1	65	79	76
377	1927-28	26-4-28	"	8	157	6.89	21.86	29.6	45.2	5.1	1,338	29.3	6.6	13.8	6.5	5.6	9.6	4	2.1	21.3	88	65	69
508	1928-29	6-5-29	"	..	..	..	..	9	158	7.15	21.86	28.8	52.9	4.1	1,523	29.4	77.0	3.1	2,264	30.1	7.3	12.8	2.5	6.2	8.9	4	1.6	21.1	92	62	68
1032/1	1930-31	28-4-31	"	..	..	..	..	12	160	6.67	21.86	29.4	55.3	5.1	1,626	29.3	87.6	2.2	2,567	30.3	7.5	13.5	4.0	6.9	10.9	3	1.0	21.0	87	65	63
1032/2	"	"	"	..	..	..	..	8	160	6.67	21.86	30.2	54.0	6.3	1,631	30.6	86.6	2.0	2,650	29.8	7.8	11.0	2.5	6.9	7.4	3	1.2	21.2	87	65	69
508	1928-29	7-5-29	31	..	..	..	..	4	147	8.36	23.26	33.8	41.4	5.4	1,999	33.9	60.9	4.2	2,064	34.4	6.1	13.1	4.2	6.0	11.0	5	1.3	22.4	91	63	70
75	1923-24	16-11-25	40	..	..	..	..	12	115	8.98	26.97	40.1	26.9	7.7	1,079	..	..	..	..	..	5.0	9.6	0	3.3	15.8	6	1.1	..	83	78	53
76	1924-25	21-11-25	"	..	..	..	..	16	114	8.69	26.97	39.4	31.0	7.8	1,221	..	..	..	..	..	4.9	13.1	7.0	3.4	15.1	6	1.5	..	84	78	63
163	1925-26	10-8-26	"	..	..	..	..	11	113	8.60	26.97	40.4	30.1	6.2	1,216	..	..	..	..	..	4.9	14.4	6.0	3.0	17.4	7	6.1	..	85	82	81
269	1926-27	12-7-27	"	36	130	8.69	26.97	39.6	30.4	6.2	1,204	40.2	4.8	14.7	8.5	5.1	12.9	7	4.1	26.0	87	76	77
103/1	1930-31	30-4-31	"	..	..	..	..	14	131	8.39	26.97	39.5	35.3	5.4	1,394	39.5	65.8	4.7	2,599	39.4	5.6	18.1	0.5	6.5	11.9	5	1.0	26.0	90	68	67
1032/2	"	"	"	..	..	..	..	3	131	8.23	26.97	39.5	36.4	5.1	1,438	40.4	68.4	2.5	2,763	38.7	5.9	12.7	5.5	6.5	10.9	5	1.5	26.3	90	68	69

* Diameter of ring frame front roller— $\frac{3}{8}$ ". Diameter of rings— $1\frac{1}{8}$ ".

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.						
	Season 1924-25.	Season 1925-26.	Season 1926-27	Season 1927-28.	Season 1928-29.	Season 1929-30.	Season 1930-31.
2	0.2	1.3	0.5	0.3	0.5	0.4	0.2
3	1.5	2.6	1.8	2.1	2.4	2.1	2.9
4	2.5	5.1	4.1	4.1	5.6	4.7	5.5
5	8.3	10.3	9.6	9.3	13.0	10.5	11.0
6	21.4	22.0	19.1	19.2	26.5	20.3	23.8
7	42.0	31.5	34.6	32.1	27.2	33.3	32.6
8	17.8	19.6	21.7	21.7	25.1	20.6	17.2
9	4.9	6.7	6.8	7.7	6.2	7.7	5.9
10	1.2	0.9	1.8	0.1	1.3	0.4	0.9
11	0.2	..	..	..	..	..	..
2. Fibre-Length (inch):							
(a) By Balls Sorter ..	0.85	0.83	0.85	0.85	0.81	0.84	0.82
(b) By Baer Sorter ..	0.84	0.83	0.85	0.85	0.82	0.83	0.82
3. Fibre-Weight per inch (millionth of an ounce) ..							
	0.164	0.173	0.192	0.183	0.186	0.181	0.161
4. Fibre-Strength (oz.):							
(a) By Balls Tester ..	..	..	0.191	0.187	0.163	0.176	0.166
(b) By O'Neill Tester ..	..	..	0.176	0.167	0.156	0.166	0.148
5. Fibre-Strength per unit fibre-weight per inch ..							
	..	..	0.95	0.97	0.85	0.94	0.98
6. Fibre-Rigidity (millionth of an ounce, square-inch) ..							
	..	..	0.170	0.150	0.184	0.215	0.119
7. Ribbon-Width (thousandth of an inch) ..							
	0.70	0.64	0.65	0.62	0.70	0.78	0.66
8. Convolutions per inch ..							
	121	114	57	62	74	50	71

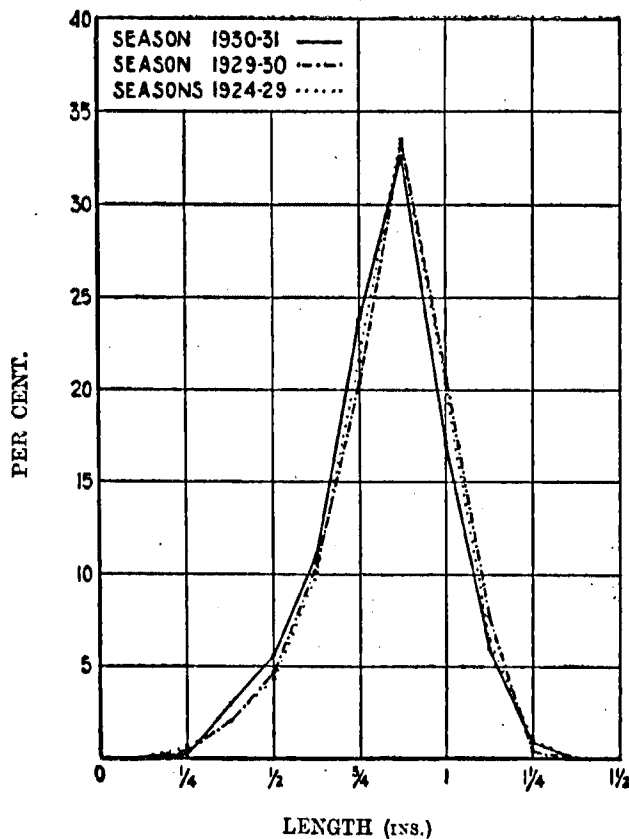


FIG. 20.—Sorter diagrams for Karunganni C7

IV. SPINNING TESTS.

1. *Treatment* :—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1. The 1926-27 cotton was passed direct through the Crighton (once only); its subsequent treatment was the same as for the other seasons' cottons.
2. *Spinning Master's Report* :—
 - 1924-25 cotton: clean, whitish, very soft, shed unusual amount of fly.
 - 1925-26 cotton: clean, white and bright; except for a little seediness it is a very well-ginned sample; card web shed excessive fly.
 - 1926-27 cotton: creamy-white, clean, a little leafy, well-ginned.
 - 1927-28 cotton: creamy-white; fairly bright; clean; has a nice feel; nepped in ginning; contains too many unginned seeds (0.8 per cent.)
 - 1928-29 cotton: creamy-white; bright; very clean; has a good soft feel; well-ginned except for a few full clean seeds.
 - 1929-30 cotton: creamy-white; bright; perfectly clean; has a good bodied feel; well-ginned; the staple is regular in length, and strong.
 - 1930-31 cotton: creamy-white; bright; has a slightly soft but good bodied feel; very clean; well-ginned. The card sliver is clean, web slightly neppy and ten flat strips weigh 13.7 grams.
3. *Spinning Test Results* :—See Table 20, page 105.

V. REMARKS.

(i) *Fibre*.—The fibre-length of this cotton is nearly the same in the different seasons. The fibre-weight per inch is variable, being rather low in 1930-31. The fibre-strength is comparatively high in 1926-27 and low in 1930-31, though in the latter year the fibre-strength per unit fibre-weight per inch is by no means low. The fibre-rigidity is high in 1929-30 and very low in 1930-31. The ribbon-width is low in 1927-28 and high in 1929-30. The number of convolutions per inch is highly variable, being less than half in 1929-30 than in 1924-25 or 1925-26.

(ii) *Waste*.—This is a very clean cotton and has always yielded a small blow-room loss. The card-room loss is about 8 per cent. and does not vary much with the season.

(iii) *Breakages*.—With few exceptions yarn-breakages in the ring frame are rather numerous for this cotton, even in 20's counts. They are very numerous for the 1929-30 sample.

(iv) *Yarns*.—This cotton usually yields even 20's A and fairly even 30's, though the 30's yarns of the 1925-26 and 1927-28 cottons were more even. The yarns are usually somewhat neppy, being less neppy in 1924-25 and 1925-26. In 1928-29 the yarn-strength results were rather poor, otherwise they do not show much variation with the season.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons :—

1924-25	..	26's.
1925-26	..	26's.
1926-27	..	24's.
1927-28	..	24's.
1928-29	..	20's.
1929-30	..	23's.
1930-31	..	26's.

TABLE 20.—SPINNING TEST RESULTS FOR KARUNGANNI C 7.

HANK (1930-31).
 Draw-frame .. 0.18
 Slubber .. 0.79
 Inter .. 1.69
 Rover .. 4.54

TRAVELLER COUNTS.
 20 .. 3/0
 26 .. 5/0
 30 .. 7/0

SPINDLE SPEED (1930-31).
 20 A .. 9,450 r. p.m.
 20 B .. 8,900 r. p.m.
 26 .. 8,900 r. p.m.
 30 .. 9,000 r. p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.													TEMPERATURE. (°F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch lbs.)	Work Irregularity (%)	Count-work product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%).					Extension Irregularity (%).	Evenness Class.	Neps per Yard.	Turns per Inch Actual.
80	1924-25	11-3-26	20A	5.8	8.3	1.1	14.5	17	182	4.04	18.85	19.6	79.4	7.1	1,556	..	..	..	..	..	9.8	10.9	3.0	5.2	8.3	3	2.5	..	87	71	51
175	1925-26	13-10-26	"	4.1	7.9	0.3	11.9	7	184	4.30	16.85	20.1	70.1	9.4	1,409	..	..	..	..	..	10.6	13.4	4.7	5.6	10.4	3	1.7	..	87	68	67
270	1926-27	13-7-27	"	2.8	8.0	0.6	11.1	29	193	4.35	16.85	20.1	68.6	6.8	1,379	..	..	..	..	..	9.5	14.6	7.5	6.2	7.7	3	3.9	16.2	85	79	72
383	1927-28	11-5-28	"	5.3	8.5	0.2	13.5	82	196	4.57	16.85	19.8	70.5	6.6	1,396	..	..	..	..	..	10.7	14.4	7.1	5.8	8.1	3	3.2	10.3	91	64	69
510	1928-29	7-5-29	"	4.4	8.2	0.6	12.8	57	188	4.27	16.85	19.4	56.7	5.7	1,100	19.6	107.6	4.3	2109	19.6	9.7	11.8	5.5	6.6	10.0	4	4.2	16.2	91	65	70
717	1929-30	24-4-30	"	3.8	8.5	0.6	12.6	95	186	4.60	16.85	19.3	67.2	8.1	1,297	19.8	118.8	3.9	2352	20.5	9.6	16.4	9.5	5.6	11.4	3	3.7	16.1	92	61	63
1045/1	1930-31	7-5-31	"	4.8	8.8	0.4	13.5	29	190	4.55	16.85	19.7	71.1	5.1	1,401	20.0	120.6	3.1	2412	19.9	10.7	13.6	7.0	7.3	8.6	3	3.2	16.4	91	70	70
1045/2	"	"	"	5.0	8.9	0.4	13.7	46	190	4.65	16.85	19.7	71.9	7.0	1,419	19.7	122.4	2.6	2411	19.4	11.8	12.0	5.0	6.8	7.4	3	4.0	16.3	91	70	69
270	1929-27	13-7-27	20B	..	..	..	..	12	191	4.35	17.98	20.0	81.2	5.9	1,624	..	..	..	..	..	10.5	11.6	4.5	6.3	6.6	3	4.1	17.4	85	78	71
510	1928-29	8-5-29	"	..	..	..	..	36	187	4.44	17.98	19.4	68.9	6.2	1,337	19.7	118.8	4.5	2340	20.0	10.7	13.5	7.0	6.7	10.4	4	4.4	17.3	90	65	73
717	1929-30	24-4-30	"	..	..	..	..	37	190	4.65	17.98	19.6	77.2	6.9	1,513	19.6	126.9	3.5	2487	20.0	11.1	10.1	2.7	5.8	9.9	3	3.8	17.2	90	64	62
1045/1	1930-31	7-5-31	"	..	..	..	..	86	190	4.55	17.98	20.1	79.9	5.0	1,606	20.5	122.2	1.9	2505	20.5	11.3	11.2	4.5	7.2	9.0	3	4.2	17.0	90	73	70
1045/2	"	"	"	..	..	..	..	57	190	4.65	17.98	19.6	85.2	7.3	1,670	19.6	132.0	3.2	2587	19.6	12.5	10.9	3.0	7.1	8.9	3	4.7	17.2	90	73	70
383	1927-28	11-5-28	26	..	..	..	..	22	171	5.24	20.23	25.6	62.4	8.3	1,341	..	..	..	..	..	8.2	13.4	7.5	5.3	11.6	4	3.4	19.7	91	64	67
510	1929-29	8-5-29	"	..	..	..	..	23	152	5.79	20.23	25.4	40.0	8.6	1,016	25.3	81.9	4.0	2072	25.7	7.4	17.0	10.0	6.0	8.8	6	3.8	19.4	91	64	72
717	1929-30	24-4-30	"	..	..	..	..	76	169	6.10	20.23	25.0	48.7	8.3	1,217	25.6	94.4	3.0	2417	26.6	7.2	15.0	10.5	4.9	12.7	5	4.1	19.4	91	61	62
1045/1	1930-31	9-5-31	"	..	..	..	..	36	159	5.74	20.23	25.4	57.0	6.2	1,448	25.5	97.4	2.4	2484	25.5	8.4	12.7	4.5	7.0	8.6	4	6.5	19.3	91	67	70
1045/2	"	"	"	..	..	..	..	32	159	6.06	20.23	25.7	53.4	9.2	1,372	25.2	97.8	2.1	2465	25.2	8.9	11.5	4.0	6.6	10.4	5	5.0	19.4	91	67	71
80	1924-25	12-3-26	30A	..	..	..	..	8	140	6.66	21.86	29.6	44.4	8.2	1,314	..	..	..	..	..	6.4	12.7	4.7	4.6	12.2	5	2.2	..	87	73	..
175	1925-26	13-10-26	"	..	..	..	..	8	142	6.37	21.86	29.6	47.3	8.3	1,406	..	..	..	..	..	7.3	13.5	7.5	4.7	11.9	4	1.9	..	86	66	65
270	1926-27	15-7-27	"	..	..	..	..	42	158	6.58	21.86	30.4	40.5	9.3	1,231	..	..	..	..	..	6.5	13.8	6.7	5.7	10.0	5	3.0	21.1	86	77	71
383	1927-28	12-5-28	"	..	..	..	..	25	151	6.81	21.86	29.9	42.2	12.1	1,262	..	..	..	..	..	6.5	12.6	7.7	5.2	10.0	4	3.6	21.3	90	64	68
1045/1	1930-31	8-5-31	"	..	..	..	..	49	148	6.90	21.86	30.0	41.0	9.9	1,230	30.7	81.6	3.3	2505	30.6	6.5	16.8	11.0	6.0	9.9	5	4.0	21.1	91	68	70
1045/2	"	"	"	..	..	..	..	46	148	7.07	21.86	30.7	35.5	8.6	1,099	30.8	78.2	3.4	2409	30.1	6.7	14.6	8.0	5.9	14.1	6	4.7	20.9	91	68	71
80	1924-25	12-3-26	30B	..	..	..	..	8	134	6.13	23.11	29.2	51.4	6.4	1,501	..	..	..	..	..	7.0	12.9	4.2	5.1	11.6	6	2.7	..	87	74	65
175	1925-26	14-10-26	"	..	..	..	..	8	134	6.45	23.11	29.2	51.8	8.5	1,513	..	..	..	..	..	7.7	12.4	3.7	4.9	13.0	4	1.6	..	87	65	67

* Diameter of ring frame front roller— $\frac{3}{8}$ ". Diameter of rings— $\frac{1}{8}$ ".

21. AMERICAN COTTONS.

Mississippi American : Season 1923-24 (Sample No. 55).*Memphis American* : Season 1925-26 (Sample No. 200).*Texas American* : Seasons. { 1923-24 (Sample No. 56).
1925-26 (Sample No. 206).
1926-27 (Sample No. 653).

I. GRADER'S REPORT.

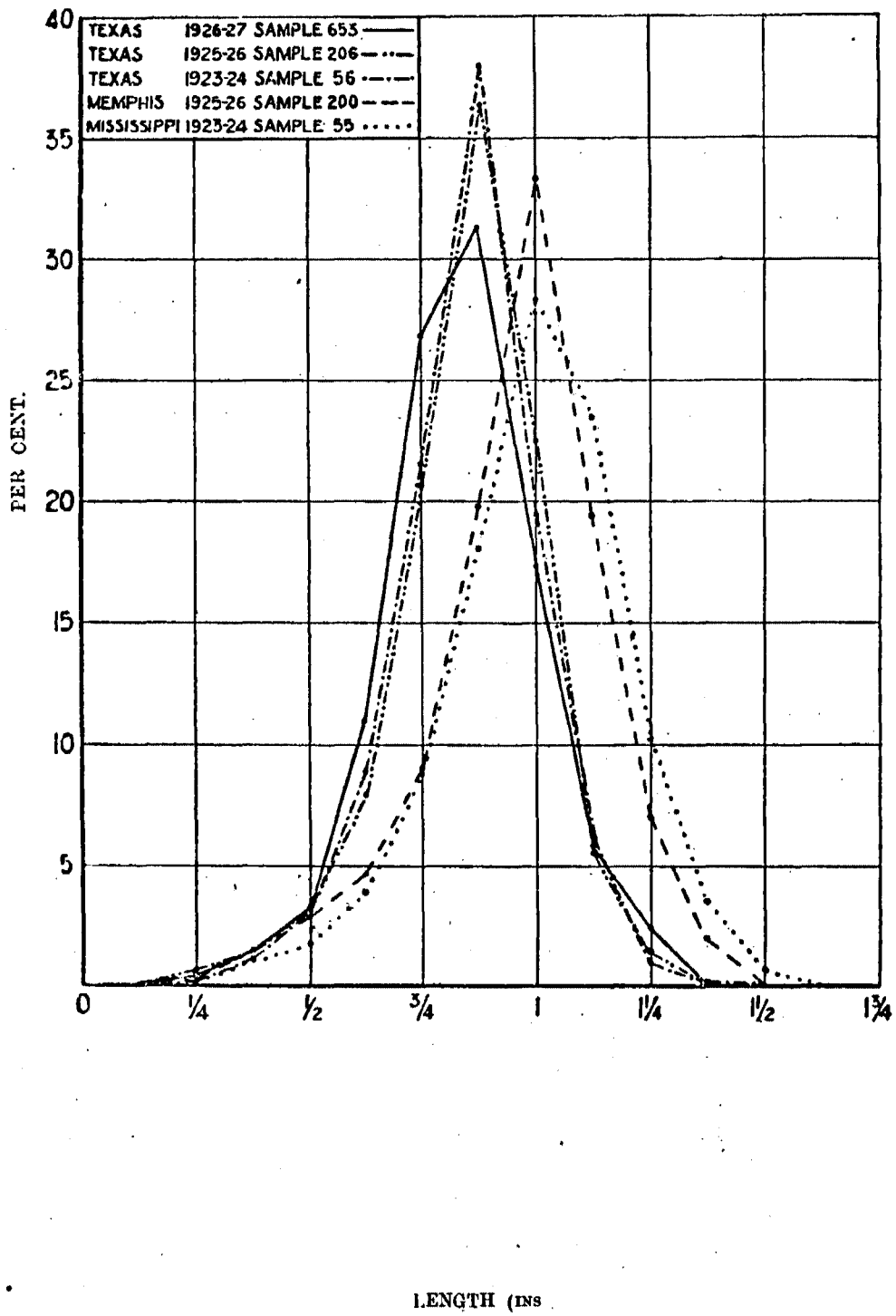
	Mississippi.	Memphis.	Texas.		
			1923-24.	1925-26.	1926-27.
Class	Fully Middling.	Middling.	Fully Middling.	Strict Middling.	Middling.
Colour	White.	White.	White.	Creamy.	White.
Staple Length	1-1 1/16 inch	1 1/8 inch.	7/8 inch.	One inch.	1 1/16 inch.
Staple Strength	Good.	Good.	Good.	Good.	Good.
Regularity	Regular.	Very Fair.	Regular.	Fair.	Good.

II. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.				
	Mississippi.	Memphis.	Texas.		
			1923-24.	1925-26.	1926-27.
2	0.2	0.3	0.2	0.7	0.5
3	1.1	1.5	1.2	1.5	1.5
4	1.8	2.9	3.2	3.3	3.4
5	3.9	4.7	8.9	7.9	11.0
6	8.8	9.1	21.6	20.7	26.8
7	18.1	19.8	38.0	36.4	31.3
8	28.3	33.3	19.5	22.5	17.3
9	23.4	19.4	6.2	5.6	5.8
10	10.2	7.0	1.0	1.4	2.4
11	3.5	2.0	0.2	..	..
12	0.7	..	..	..	..
2. Fibre-Length (inch):—					
(a) By Balls Sorter	0.99	0.96	0.85	0.85	0.83
(b) By Baer Sorter	0.99	0.95	0.86	0.88	0.84
3. Fibre-Weight per inch (millionth of an ounce) ..	0.183	0.181	0.213	0.206	0.234
4. Fibre-Strength (oz.):—					
(a) By Balls Tester	0.184	0.152	0.176	0.172	0.154
(b) By O'Neill Tester	0.176	0.157	0.175	0.157	0.159
5. Fibre-Strength per unit fibre-weight per inch ..	0.98	0.86	0.82	0.80	0.67
6. Fibre-Rigidity (millionth of an ounce, square-inch)	0.138	0.146	0.200	0.210	0.292
7. Ribbon-Width (thousandth of an inch) ..	0.65	0.62	0.65	0.58	0.76
8. Convolution per inch	142	110	142	140	96

SORTER DIAGRAMS FOR AMERICAN COTTONS



LENGTH (INS)
Fig. 21.

III. SPINNING TESTS.

1. *Treatment* :—Lattice Feeder, Crighton (twice), Hopper, Scutcher (three times), Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving in Ring Frame No. 1.
2. *Spinning Master's Report* :—

Memphis.—Strong and white; too much leaf and stalk, badly ginned, containing cut seed with hairs attached, gin nep, knot and string, and undeveloped seeds (0.6 per cent.). Gin knot and string is very prominent at the dead plate in the finisher scutcher; lap is too leafy; card web a little too neppy; strips leafy and neppy; licker-in fly shows the leafiness of the material; web shedding lower than usual (0.04 per cent.); draw frame web very evenly drawn but contains a little too much fine nep; fly frame required (roughly) 6 per cent. less twist than usual; roving stuff fairly clean.

Texas.—1925-26: clean and fairly bright; a little leafy, free of seed; too many undeveloped seeds (one per cent.); contains a good deal of fine gin string and nep; licker-in fly shows leaf and nep; strips a little leafy and neppy, card web also a little neppy; drawing frame web evenly drawn with very little nep; fly frames normal. Yarn is clean.

Texas.—1926-27: Brightish creamy; slightly stained; has a good bodied feel; very well-ginned; the staple is on the fine (thin) side, is fairly even in length, and of fairly uniform strength.

3. *Spinning Test Results* :—See Table 21, page 109.

IV. REMARKS.

Mississippi :—The results for this cotton were much below what was expected for American cotton of its class; it is suitable for standard warp yarn up to 30's counts.

Memphis :—This cotton is decidedly superior to the Mississippi sample, and is suitable for standard warp yarn up to 39's counts. This contrast is rather curious in view of the fact that in its fibre-properties the Mississippi cotton would appear to be the better, for it is slightly longer and decidedly stronger per unit fibre-weight per inch.

Texas :—The samples of Texas cottons of different seasons show distinct differences from one another. In fibre-length and fibre-weight per inch the 1923-24 and 1925-26 samples resemble one another very closely, but the 1925-26 sample is suitable for standard warp yarn up to 32's counts, whereas the 1923-24 sample is only suitable for standard counts up to 24's. The 1926-27 sample is slightly shorter but decidedly coarser than the other two samples, and is suitable for standard warp counts up to 20's.

TABLE 21.—SPINNING TEST RESULTS FOR AMERICAN COTTONS.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.				YARN TEST RESULTS.											TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)				
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.		
												Counts Actual.	Strength (lbs.)	Irregularity (%).	Count-Strength Product.	Counts.	Strength (ozs.)	Irregularity (%).	Weakness Percentage.	Extension (%).	Irregularity (%).	Evenness Class.					Neps per yard.	Turns per inch actual.
55	Mississippi	2-9-25	20A	4.4	7.3	0.4	11.8	17	157	4.35	16.85	19.5	95.2	5.4	1,856	..	10.2	11.6	3.6	5.7	16.8	1½	1.3	..	88	87	86	
"	"	"	32	..	..	..	..	0	116	7.00	22.84	30.6	47.7	6.0	1,400	..	6.4	9.8	1.3	4.2	18.8	4	1.5	..	88	87	85
"	"	3-9-25	40	..	..	..	..	1	98	9.00	27.23	39.3	31.9	7.5	1,254	..	4.7	11.7	5.6	4.1	22.3	6½	1.2	..	87	87	86
200	Memphis.	20-12-26	20A	6.5	8.1	0.3	14.4	5	159	4.55	16.86	19.7	103.8	4.1	2,045	..	12.9	8.1	0	8.2	7.9	2	1.3	..	81	64	61	
"	"	"	30	..	..	..	..	8	123	6.98	22.13	30.5	57.8	4.1	1,763	..	7.8	11.6	0.5	7.2	8.2	3	1.3	..	81	60	64
"	"	21-12-26	40	..	..	..	..	4	98	9.13	27.23	39.6	37.0	5.3	1,465	..	5.6	13.0	2.0	6.5	11.4	5	1.7	..	82	60	62
56	Texas.	17-9-25	20A	5.4	9.0	1.3	14.9	32	190	5.81	16.85	19.8	61.4	7.9	1,216	..	8.6	14.5	7.8	3.9	13.4	3½	0.8	..	87	70	54	
206	1923-24	29-1-27	"	5.2	6.7	0.3	11.8	5	182	4.49	16.85	20.1	84.3	4.1	1,694	..	12.0	9.7	0.7	7.8	6.6	3	1.2	..	80	67	66	
"	"	31-1-27	30A	..	..	..	..	0	142	6.78	21.86	29.3	50.2	5.9	1,471	..	7.0	12.3	4.5	5.9	9.5	4	1.1	..	81	68	51
"	"	"	20B	..	..	..	..	1	133	6.78	23.11	29.5	51.2	4.5	1,510	..	7.5	11.1	1.5	6.2	8.7	4½	1.7	..	81	60	53
"	"	1-2-27	40	..	..	..	..	5	114	8.83	28.97	39.6	30.0	8.1	1,212	..	5.0	15.3	7.5	5.3	13.0	6	1.6	..	87	70	60
553	1926-27	24-1-30	20A	5.6	7.5	0.5	13.2	20	194	5.00	16.85	20.4	56.4	5.5	1,150	..	..	..	..	..	..	4	1.7	16.1	84	61	64
"	"	"	20B	..	..	..	..	60	192	5.00	17.98	20.2	67.1	4.4	1,355	..	..	..	..	..	..	4	2.2	17.2	84	63	60
"	"	"	20C	..	..	..	..	80	190	5.00	20.23	19.8	77.1	2.9	1,526	..	..	..	..	..	..	5	1.5	19.5	83	63	61
"	"	"	20D	..	..	..	..	80	173	5.10	22.47	20.0	76.4	3.9	1,523	..	..	..	..	..	..	4	1.2	21.2	82	62	60
"	"	"	24A	..	..	..	..	176	130	5.95	19.73	24.0	50.7	7.7	1,217	..	..	..	..	..	..	6	1.0	18.5	82	64	63
"	"	25-1-30	24B	..	..	..	..	112	173	6.22	21.86	24.7	56.0	3.4	1,383	..	..	..	..	..	..	5	1.7	21.0	83	59	68
"	"	"	30A	..	..	..	..	230	153	7.53	21.86	30.8	31.3	9.7	964	..	..	..	..	..	..	6	2.2	21.0	83	61	67
"	"	"	30B	..	..	..	..	93	160	7.50	24.52	30.0	41.2	4.6	1,236	..	..	..	..	..	..	7	1.5	23.8	82	64	71

TABLE 22—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-31.

A—ENGLISH UNITS.

Report No.	Cotton.	Season.	Fibre- Length (inch.)	Fibre- Weight per inch. (10. ⁻⁶ oz.)	Fibre- Strength (oz.)	Fibre- Strength (oz.) + Fibre- Weight per inch (10. ⁻⁶ oz.)	Ribbon Width. 10. ⁻³ inch.	Convolu- tions per inch.	Fibre- Rigidity (oz.-in. ² × 10. ⁻⁶)	Fibre- Rigidity ÷ (Fibre- Weight) ² × 10 ³	Highest Standard Warp Counts.
1	Dharwar I	1926-27	0.89	0.204	0.168	0.82	0.61	67	0.109	0.26	34
		1927-28	0.89	0.202	0.152	0.75	0.65	76	0.132	0.32	32
		1928-29	0.87	0.182	0.129	0.71	0.61	81	0.128	0.39	34
		1929-30	0.87	0.190	0.162	0.85	0.71	88	0.141	0.39	30
		1930-31	0.86	0.164	0.142	0.87	0.62	92	0.120	0.45	30
2	Jayawant	1929-30	0.91	0.190	0.192	1.01	0.72	78	0.238	0.66	32
		1930-31	0.89	0.196	0.179	0.92	0.65	72	0.180	0.47	30
3	Gadag 1	1926-27	0.81	0.179	0.141	0.79	0.63	110	0.151	0.47	38
		1927-28	0.86	0.167	0.148	0.89	0.62	115	0.152	0.55	38
		1928-29	0.82	0.162	0.141	0.87	0.59	122	0.138	0.53	28
		1929-30	0.84	0.148	0.140	0.95	0.64	140	0.157	0.72	32
		1930-31	0.87	0.153	0.138	0.90	0.66	120	0.152	0.65	35
4	Surat 1027 A. L. F. ..	1926-27	0.97	0.200	0.171	0.85	0.73	96	0.162	0.40	32
		1927-28	0.94	0.207	0.167	0.81	0.74	73	0.132	0.31	30
		1928-29	0.96	0.204	0.165	0.81	0.71	63	0.125	0.30	32
		1929-30	0.97	0.180	0.171	0.95	0.74	45	0.157	0.48	34
		1930-31	0.94	0.201	0.186	0.93	0.67	63	0.192	0.48	29
5	Wagad 8	1926-27	0.80	0.264	0.178	0.67	0.72	45	0.221	0.32	14
		1927-28	0.77	0.189	0.124	0.66	0.72	46	0.122	0.34	15
		1928-29	0.80	0.239	0.144	0.60	0.76	58	0.135	0.24	15
		1929-30	0.75	0.195	0.133	0.68	0.77	56	0.139	0.36	12
		1930-31	0.78	0.257	0.172	0.67	0.77	59	0.288	0.44	12
6	P. A. 4 F.	1926-27	0.78	0.134	0.132	0.99	0.70	104	0.093	0.52	24
		1927-28	0.79	0.186	0.156	0.84	0.70	102	0.210	0.61	22
		1928-29	0.76	0.197	0.169	0.86	0.68	99	0.234	0.60	16
		1929-30	0.81	0.155	0.167	1.08	0.69	107	0.215	0.89	20
		1930-31	0.77	0.198	0.181	0.92	0.71	110	0.226	0.58	22
7	P. A. 289 F.	1926-27	0.97	0.098	0.109	1.11	0.62	88	0.053	0.55	40
		1927-28	0.94	0.142	0.135	0.95	0.62	118	0.092	0.46	42
		1928-29	0.96	0.122	0.151	1.24	0.58	122	0.093	0.62	39
		1929-30	1.00	0.142	0.148	1.05	0.61	145	0.101	0.50	42
		1930-31	0.96	0.142	0.138	0.98	0.62	136	0.129	0.64	44
8	Mollisoni	1926-27	0.68	0.272	0.164	0.60	0.77	65	0.242	0.33	8
		1927-28	0.73	0.335	0.195	0.58	0.88	114	0.463	0.41	8
		1928-29	0.69	0.303	0.182	0.60	0.76	109	0.512	0.66	7
		1929-30	0.69	0.272	0.167	0.61	0.81	87	0.386	0.52	8
		1930-31	0.69	0.287	0.170	0.59	0.76	90	0.420	0.51	8
9	Aligarh A. 19	1926-27	0.66	0.301	0.187	0.62	0.79	80	0.361	0.40	7
		1927-28	0.70	0.305	0.199	0.66	0.82	72	0.450	0.48	7
		1928-29	0.71	0.324	0.225	0.69	0.74	67	0.641	0.61	7
		1929-30	0.68	0.277	0.211	0.76	0.78	74	0.506	0.66	7
		1930-31	0.66	0.301	0.204	0.68	0.77	69	0.672	0.74	7
10	Cawnpore K. 22	1926-27	0.73	0.240	0.178	0.74	0.71	72	0.280	0.49	12
		1927-28	0.75	0.244	0.174	0.72	0.78	70	0.376	0.63	12
		1928-29	0.78	0.225	0.166	0.74	0.68	71	0.257	0.51	14
		1929-30	0.70	0.210	0.171	0.81	0.68	78	0.392	0.69	11
		1930-31	0.76	0.196	0.160	0.82	0.73	79	0.306	0.80	12
11	Bundelkhand J. N. 1. ..	1926-27	0.77	0.242	0.183	0.76	0.71	65	0.216	0.37	14
		1927-28	0.74	0.226	0.199	0.88	0.71	74	0.245	0.48	14
		1928-29	0.76	0.236	0.204	0.86	0.72	85	0.280	0.50	13
		1929-30	0.75	0.229	0.185	0.81	0.71	81	0.300	0.57	12
		1930-31	0.76	0.218	0.175	0.80	0.76	82	0.315	0.66	12
12	Cawnpore American C. A. 9 ..	1926-27	0.87	0.182	0.160	0.88	0.61	119	0.185	0.56	34
		1927-28	0.86	0.176	0.151	0.86	0.63	105	0.170	0.55	30
		1928-29	0.80	0.166	0.158	0.95	0.60	127	0.239	0.87	40
		1929-30	0.87	0.165	0.168	1.02	0.64	108	0.294	1.06	34
		1930-31	0.86	0.154	0.147	0.95	0.62	124	0.225	0.95	37

TABLE 22—(contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-31.

A.—ENGLISH UNITS—(contd.)

Report No.	Cotton.	Season.	Fibre- Length (inch.)	Fibre- Weight per inch. (10. ⁻⁶ oz.)	Fibre- Strength (oz.)	Fibre- Strength (oz.) ÷ Fibre- Weight per inch. (10. ⁻⁶ oz.)	Ribbon Width 10. ⁻³ inch.	Convolu- tions per inch.	Fibre- Rigidity (oz.-in. ² × 10. ⁻⁶)	Fibre- Rigidity ÷ (Fibre- Weight) ² × 10. ³	Highest Standard Warp Counts.
13(a)	Verum 262 (Nagpur) ..	1923-29	0.85	0.215	0.199	0.93	0.62	72	0.193	0.42	26
	" ..	1929-30	0.81	0.166	0.175	1.06	0.64	92	0.218	0.79	21
	" ..	1930-31	0.82	0.186	0.196	1.05	0.61	82	0.189	0.52	26
13(b)	Verum 262 (Akola) ..	1928-29	0.83	0.187	0.174	0.93	0.63	79	0.136	0.39	23
	" ..	1929-30	0.84	0.176	0.171	0.97	0.63	88	0.202	0.65	21
	" ..	1930-31	0.79	0.170	0.168	0.99	0.63	79	0.237	0.82	18
14	Umri Bani	1926-27	0.81	0.200	0.186	0.93	0.67	65	0.160	0.40	24
	"	1927-28	0.81	0.192	0.179	0.94	0.63	93	0.183	0.51	24
	"	1928-29	0.83	0.185	0.176	0.96	0.63	88	0.196	0.57	22
	"	1929-30	0.81	0.152	0.171	1.13	0.64	90	0.185	0.80	27
	"	1930-31	0.80	0.175	0.176	1.01	0.67	122	0.189	0.62	28
15	Cambodia Co. 1 (205) ..	1926-27	0.92	0.155	0.127	0.82	0.59	91	0.124	0.52	38
	"	1927-28	0.93	0.164	0.138	0.84	0.60	110	0.134	0.50	34
	"	1928-29	0.93	0.170	0.125	0.74	0.62	126	0.179	0.62	32
	"	1929-30	0.89	0.146	0.136	0.93	0.70	121	0.176	0.83	34
	"	1930-31	0.87	0.156	0.135	0.87	0.67	103	0.211	0.87	29
16	Cambodia Co. 2 (440) ..	1927-28	0.88	0.141	0.123	0.87	0.62	108	0.138	0.69	33
	"	1928-29	0.92	0.148	0.099	0.67	0.61	90	0.099	0.45	26
	"	1929-30	0.89	0.136	0.123	0.91	0.64	116	0.224	1.21	28
	"	1930-31	0.92	0.133	0.116	0.88	0.66	94	0.145	0.82	29
17	Nandyal 14	1926-27	0.93	0.191	0.223	1.17	0.61	46	0.142	0.39	34
	"	1927-28	0.88	0.196	0.229	1.17	0.67	56	0.147	0.38	31
	"	1928-29	0.91	0.187	0.236	1.26	0.65	60	0.169	0.48	31
	"	1929-30	0.91	0.169	0.232	1.38	0.65	70	0.169	0.59	35
	"	1930-31	0.86	0.167	0.209	1.25	0.67	67	0.137	0.49	35
18	Hagari 1	1928-29	0.84	0.207	0.140	0.68	0.65	78	0.164	0.38	24
	"	1929-30	0.84	0.175	0.128	0.73	0.71	88	0.129	0.42	27
	"	1930-31	0.91	0.166	0.155	0.94	0.66	74	0.128	0.46	36
19	Hagari 25	1926-27	0.76	0.177	0.110	0.62	0.65	54	0.097	0.31	26
	"	1927-28	0.87	0.205	0.135	0.66	0.70	76	0.112	0.27	26
	"	1928-29	0.90	0.188	0.132	0.70	0.65	75	0.098	0.28	30
	"	1929-30	0.86	0.178	0.136	0.77	0.66	63	0.128	0.40	25
	"	1930-31	0.90	0.195	0.149	0.76	0.68	75	0.128	0.34	36
20	Karunganni C 7	1926-27	0.85	0.192	0.183	0.95	0.65	57	0.170	0.46	24
	"	1927-28	0.85	0.183	0.177	0.97	0.62	62	0.156	0.47	24
	"	1928-29	0.81	0.186	0.159	0.85	0.70	74	0.184	0.53	20
	"	1929-30	0.83	0.181	0.171	0.94	0.78	59	0.215	0.66	23
	"	1930-31	0.82	0.161	0.157	0.98	0.66	71	0.119	0.46	26
21	Mississippi	1923-24	0.99	0.183	0.180	0.98	0.65	142	0.138	0.41	30
	Memphis	1925-26	0.95	0.181	0.154	0.86	0.62	110	0.146	0.45	39
	Texas	1923-24	0.85	0.213	0.175	0.82	0.65	142	0.209	0.46	24
	"	1925-26	0.86	0.206	0.164	0.89	0.58	140	0.210	0.49	32
	"	1926-27	0.83	0.234	0.156	0.67	0.76	96	0.292	0.53	20

TABLE 22—(contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-31.

B.—METRIC UNITS.

Report No.	Cotton.	Season.	Fibre- Length (mm.)	Fibre- Weight per cm. (10. ⁶ gm.)	Fibre- Strength (gm.)	Fibre- Strength + Fibre- Weight (10. ⁶ gm.)	Ribbon width, (10. ³ cm.)	Convolut- ions per cm.	Fibre- Rigidity, (10. ³ dynes × cm. ²)	Fibre- Rigidity ÷ (Fibre- Weight) ² 10 ¹⁰	Highest Standard Warp Counts.
1	Dharwar I	1926-27	22.6	2.28	4.77	2.09	1.55	26	1.95	0.38	34
		1927-28	22.6	2.26	4.30	1.90	1.64	30	2.35	0.46	32
		1928-29	22.1	2.04	3.67	1.80	1.56	32	2.29	0.55	34
		1929-30	22.2	2.12	4.59	2.17	1.82	35	2.54	0.56	30
		1930-31	21.9	1.83	4.03	2.20	1.58	36	2.16	0.64	30
2	Jayawant	1929-30	23.1	2.12	5.45	2.57	1.82	31	4.26	0.95	32
		1930-31	22.6	2.18	5.07	2.33	1.64	28	3.23	0.68	30
3	Gadag I	1926-27	20.5	2.00	3.99	2.00	1.60	43	2.68	0.67	38
		1927-28	21.8	1.87	4.20	2.25	1.57	45	2.72	0.78	38
		1928-29	20.9	1.82	3.99	2.19	1.50	48	2.47	0.75	26
		1929-30	21.4	1.65	3.99	2.42	1.64	55	2.80	1.03	32
		1930-31	22.2	1.71	3.82	2.29	1.67	47	2.73	0.93	35
4	Surat 1027 A. L. F. ..	1926-27	24.7	2.23	4.85	2.17	1.85	38	2.90	0.58	32
		1927-28	24.0	2.32	4.74	2.04	1.88	29	2.38	0.44	30
		1928-29	24.4	2.28	4.67	2.05	1.81	25	2.25	0.43	32
		1929-30	24.6	2.01	4.85	2.42	1.88	18	2.81	0.70	34
		1930-31	23.8	2.24	5.30	2.37	1.71	25	3.43	0.68	29
5	Wagad 8	1926-27	20.4	2.95	5.05	1.71	1.83	18	3.97	0.46	14
		1927-28	19.6	2.10	3.52	1.68	1.82	18	2.18	0.49	15
		1928-29	20.4	2.67	4.06	1.52	1.93	23	2.42	0.34	15
		1929-30	19.1	2.18	3.77	1.73	1.96	22	2.49	0.52	12
		1930-31	19.8	2.87	4.89	1.70	1.94	23	5.16	0.63	12
6	P. A. 4. F.	1926-27	19.8	1.50	3.74	2.49	1.78	41	1.67	0.74	24
		1927-28	20.1	2.07	4.43	2.14	1.80	40	3.78	0.88	22
		1928-29	19.3	2.20	4.78	2.17	1.74	39	4.19	0.87	16
		1929-30	20.7	1.73	4.73	2.73	1.76	42	3.85	1.29	20
		1930-31	19.6	2.21	5.15	2.33	1.80	43	4.06	0.83	22
7	P. A. 289 F.	1926-27	24.6	1.10	3.09	2.81	1.57	35	0.96	0.79	40
		1927-28	23.8	1.59	3.84	2.42	1.59	47	1.64	0.65	42
		1928-29	24.5	1.36	4.28	3.15	1.48	48	1.67	0.90	39
		1929-30	25.4	1.58	4.22	2.67	1.54	57	1.82	0.73	42
		1930-31	24.3	1.59	3.91	2.46	1.59	53	2.31	0.91	44
8	Mollisoni	1926-27	17.4	3.04	4.66	1.53	1.96	26	4.33	0.46	8
		1927-28	18.5	3.74	5.54	1.48	2.22	45	8.29	0.59	8
		1928-29	17.5	3.38	5.16	1.53	1.93	42	9.16	0.80	7
		1929-30	17.5	3.04	4.74	1.56	2.05	34	6.92	0.75	8
		1930-31	17.5	3.20	4.83	1.51	1.93	36	7.51	0.73	8
9	Aligarh A. 19	1926-27	16.8	3.37	5.33	1.58	2.01	31	6.46	0.57	7
		1927-28	17.8	3.40	5.61	1.65	2.10	28	8.06	0.70	7
		1928-29	18.1	3.63	6.39	1.76	1.89	27	11.50	0.87	7
		1929-30	17.4	3.09	5.99	1.94	2.00	29	9.05	0.95	7
		1930-31	16.7	3.36	5.79	1.72	1.94	27	12.03	1.07	7
10	Cawnpore K. 22	1926-27	18.5	2.68	5.05	1.88	1.80	28	4.99	0.70	12
		1927-28	19.0	2.73	4.95	1.81	2.00	28	6.72	0.90	12
		1928-29	19.8	2.51	4.72	1.88	1.74	28	4.61	0.73	14
		1929-30	17.8	2.34	4.85	2.07	1.74	31	7.02	1.28	11
		1930-31	19.3	2.19	4.55	2.08	1.84	31	5.48	1.14	12
11	Bundelkhand J.N. 1 ..	1926-27	19.7	2.70	5.15	1.92	1.80	26	3.88	0.53	14
		1927-28	18.7	2.52	5.63	2.23	1.81	29	4.30	0.69	14
		1928-29	19.4	2.63	5.78	2.20	1.83	33	5.01	0.72	13
		1929-30	19.1	2.56	5.26	2.05	1.81	32	5.38	0.82	12
		1930-31	19.4	2.44	4.96	2.03	1.92	32	5.64	0.95	12
12	Cawnpore-American C. A. 9	1926-27	22.2	2.04	4.53	2.23	1.55	47	3.30	0.79	34
		1927-28	21.9	1.96	4.30	2.19	1.60	41	3.03	0.79	30
		1928-29	22.6	1.86	4.48	2.41	1.53	50	4.28	1.24	40
		1929-30	22.1	1.84	4.75	2.58	1.62	43	5.31	1.57	34
		1930-31	21.8	1.72	4.17	2.42	1.57	49	4.04	1.37	37

TABLE 22—(contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-31.

B.—METRIC UNITS—(contd.)

Report No.	Cotton.	Season.	Fibre- Length (mm.)	Fibre- Weight per cm. (10. ⁻⁶ gm.)	Fibre- Strength (gm.)	Fibre- Strength (gm.) ÷ Fibre- Weight (10. ⁻⁶ gm)	Ribbon Width, 10. ⁻³ cm.	Convolu- tions per cm.	Fibre- Rigidity (10. ⁻² dynes × c.m. ²)	Fibre- Rigidity ÷ (Fibre- Weight) ² 10 ¹⁰	Highest Standard Warp Counts.
13(a)	Verum 262 (Nagpur)	1928-29	21.7	2.40	5.64	2.35	1.58	28	3.46	0.60	26
	"	1929-30	20.5	1.85	4.97	2.69	1.64	36	3.91	1.14	21
	"	1930-31	20.9	2.07	5.55	2.68	1.54	22	3.22	0.75	25
13(b)	Ver. m 262 (Akola)	1928-29	21.2	2.08	4.95	2.38	1.60	31	2.43	0.56	23
	"	1929-30	21.3	1.96	4.85	2.47	1.61	35	2.63	0.94	21
	"	1930-31	20.2	1.90	4.77	2.51	1.60	31	4.25	1.18	18
14	Umri Bani	1926-27	20.7	2.23	5.28	2.37	1.70	26	2.87	0.58	24
	"	1927-28	20.7	2.15	5.10	2.37	1.60	37	3.38	0.73	24
	"	1928-29	21.2	2.07	5.01	2.42	1.61	34	3.52	0.82	22
	"	1929-30	20.5	1.70	4.86	2.86	1.62	36	3.31	1.15	27
	"	1930-31	20.3	1.96	5.00	2.55	1.70	48	3.39	0.88	28
15	Cambodia Co. 1 (295)	1926-27	23.5	1.73	3.60	2.08	1.50	36	2.21	0.74	38
	"	1927-28	23.7	1.83	3.90	2.13	1.51	43	2.42	0.72	34
	"	1928-29	23.6	1.90	3.54	1.86	1.58	50	3.21	0.89	32
	"	1929-30	22.6	1.63	3.87	2.37	1.77	48	3.15	1.19	34
	"	1930-31	22.1	1.75	3.83	2.19	1.69	41	3.79	1.24	29
16	Cambodia Co. 2 (440)	1927-28	22.5	1.57	3.48	2.22	1.60	43	2.47	1.00	33
	"	1928-29	23.3	1.65	2.83	1.71	1.56	35	1.77	0.65	26
	"	1929-30	22.7	1.51	3.50	2.32	1.63	46	4.02	1.76	28
	"	1930-31	23.5	1.48	3.31	2.24	1.66	37	2.60	1.19	29
17	Nandyal 14	1926-27	23.7	2.13	6.32	2.97	1.55	18	2.55	0.56	34
	"	1927-28	22.3	2.18	6.50	2.98	1.72	22	2.64	0.56	31
	"	1928-29	23.2	2.08	6.71	3.23	1.66	24	3.02	0.70	31
	"	1929-30	23.2	1.89	6.59	3.49	1.66	27	3.03	0.85	35
	"	1930-31	22.0	1.86	5.94	3.19	1.70	26	2.46	0.71	35
18	Hagari 1	1928-29	21.4	2.31	3.96	1.72	1.65	31	2.94	0.55	24
	"	1929-30	21.3	1.96	3.63	1.85	1.79	35	2.32	0.60	27
	"	1930-31	23.1	1.86	4.42	2.38	1.67	29	2.29	0.66	36
19	Hagari 25	1926-27	19.3	1.96	3.12	1.59	1.65	21	1.74	0.45	26
	"	1927-28	22.2	2.29	3.84	1.67	1.77	30	2.02	0.39	16
	"	1928-29	22.9	2.09	3.75	1.79	1.65	29	1.75	0.46	30
	"	1929-30	21.8	1.99	3.87	1.95	1.68	25	2.30	0.58	25
	"	1930-31	23.0	2.18	4.22	1.94	1.73	29	2.29	0.48	36
20	Karunganni C. 7	1926-27	21.6	2.15	5.20	2.42	1.65	22	3.05	0.66	24
	"	1927-28	21.6	2.05	5.04	2.46	1.58	24	2.80	0.67	24
	"	1928-29	20.7	2.09	4.51	2.16	1.79	29	3.30	0.76	20
	"	1929-30	21.2	2.02	4.85	2.40	1.98	20	3.84	0.94	23
	"	1930-31	20.8	1.80	4.45	2.47	1.68	28	2.13	0.66	26
21	Mississippi	1923-24	25.1	2.04	5.11	2.50	1.65	56	2.48	0.60	30
	Memphis	1925-26	24.2	2.02	4.39	2.17	1.57	43	2.62	0.64	39
	Texas	1923-24	21.7	2.38	4.97	2.09	1.65	56	3.74	0.66	24
	"	1925-26	22.0	2.30	4.69	2.04	1.47	55	3.77	0.71	32
"	1926-27	21.2	2.60	4.44	1.71	1.94	38	5.24	0.78	20	

TABLE 23.—SUMMARY OF SPINNING TEST RESULTS ON STANDARD INDIAN COTTONS, 1923-31.

(a) BOMBAY AND PUNJAB COTTONS.

1 Sample No.	2 Cotton.	3 Season.	4 Counts Nombal.	5 WASTE PERCENTAGES.				6 RING FRAME PARTICULARS.*				7 YARN TEST RESULTS.													28 TEMPERATURE (%)	29 RELATIVE HUMIDITY (%)		33 Warp Highest Standard counts.				
				8 Blow Room Loss.	9 Card Room Loss.	10 Spinning Loss.	11 Total Loss.	12 Yarn Breakages per 100 spindles per hour.	13 Front Roller Speed K. P. M.	14 Draft.	15 Turns per inch.	16 LEA.				17 BALLISTIC.				18 SINGLE THREAD.												
												19 Counts Actual.	20 Strength (lbs.)	21 Strength Irregularity (%)	22 Count-Strength Product.	23 Counts Actual.	24 Work of Rupture (inch-lb.)	25 Work Irregularity (%)	26 Count-Work Product.	27 Counts.	28 Strength (ozs.)	29 Strength Irregularity (%)	30 Weakness Percentage.	31 Extension (%)		32 Extension Irregularity (%)	33 Evenness Class.					
																													34 Neys per Yard.	35 Turns per inch Actual.	36 Spinning Room.	37 Spinning Room.
62	Dharwar 1	1923-24	20	6.4	7.8	0.7	14.3	0	183	4.49	16.85	19.7	97.5	4.7	1,021	...	...	...	...	10.7	9.6	2.4	4.2	16.5	...	1.9	...	56	79	59	34	
72	"	1924-25	20	14.7	7.7	0.9	22.7	3	183	4.39	16.85	19.1	100.2	4.7	1,914	...	...	...	...	13.0	7.1	0	4.4	10.0	...	1.2	...	70	79	61	34	
128	"	1925-26	20	12.2	7.1	0.4	18.8	2	182	4.30	16.85	19.6	90.6	4.9	1,776	...	...	...	...	11.7	8.5	0.5	6.1	10.7	...	4.0	...	99	63	63	34	
245	"	1926-27	20	12.0	7.4	0.3	19.3	2	190	4.35	16.85	19.0	98.6	5.0	1,873	...	...	...	...	19.1	13.3	1.7	7.1	7.5	...	1.4	16.2	91	65	78	34	
373	"	1927-28	20	13.0	7.0	0.1	20.0	2	191	4.33	16.85	20.0	88.7	5.0	1,774	...	...	...	...	20.2	12.3	12.1	4.5	8.5	...	2.7	16.2	88	65	69	34	
407	"	1928-29	20	14.0	7.2	0.3	21.9	2	192	4.39	16.85	20.1	91.2	5.5	1,833	20.0	129.8	3.1	2,584	20.5	12.1	8.6	1.0	7.3	8.2	...	1.4	16.3	88	64	69	34
735	"	1929-30	20	13.1	7.2	0.3	20.3	5	200	4.65	16.85	19.8	87.5	5.9	1,732	...	...	...	...	20.8	11.1	10.7	6.6	8.9	...	2.2	12.2	163	59	62	30	
755	"	1930-31	20	13.5	7.2	0.6	21.6	12	197	4.43	16.85	19.3	84.2	6.1	1,667	20.1	127.3	3.4	2,559	19.8	12.2	11.4	3.0	5.1	7.5	...	1.8	16.2	90	68	69	30
240	Jayawant	1923-24	20	4.5	6.4	0.2	10.8	5	183	4.88	16.85	19.2	107.3	4.0	2,060	...	...	...	...	14.5	9.1	1.5	7.2	7.8	...	1.1	16.8	80	62	63	30	
394	"	1924-25	20	7.6	7.6	0.4	15.2	7	185	4.30	16.85	20.0	97.0	6.0	1,910	...	...	...	...	20.3	13.1	10.5	2.0	6.2	7.1	...	1.5	16.1	87	76	70	30
593	"	1925-26	20	8.5	7.5	0.1	16.6	10	182	4.59	16.85	19.3	108.2	6.0	2,088	...	...	...	...	19.7	15.0	9.1	1.5	6.3	6.7	...	1.1	16.3	84	68	55	30
734	"	1926-27	20	9.3	7.9	0.5	17.0	10	186	4.40	16.85	19.4	99.2	5.9	1,795	20.0	122.5	2.9	2,366	20.3	13.4	9.8	1.2	6.2	7.1	...	2.2	16.4	90	61	62	32
1036	"	1930-31	20	10.1	7.8	0.6	17.4	31	192	4.35	16.85	19.5	83.9	7.4	1,661	20.1	117.2	3.0	2,350	20.2	11.9	9.8	6.2	5.8	11.3	...	1.2	16.1	91	69	68	30
70	Gang 1	1923-24	20	4.5	7.1	0.8	12.1	13	183	4.59	16.85	19.7	86.0	6.7	1,604	...	...	...	...	10.2	9.6	2.8	3.6	14.4	...	1.1	16.8	84	67	65	30	
131	"	1924-25	20	8.4	7.5	1.3	17.5	35	183	4.35	16.85	19.6	59.6	6.5	1,198	...	...	...	...	9.4	7.4	0.2	4.8	9.5	...	2.5	...	84	76	64	30	
244	"	1925-26	20	8.8	8.5	0.5	16.9	10	180	4.78	16.85	19.6	75.7	6.3	1,484	...	...	...	...	10.6	12.4	4.2	6.0	11.6	...	3.2	...	91	67	65	30	
368	"	1926-27	20	6.6	7.5	0.3	13.8	8	192	4.44	16.85	19.4	89.4	4.0	1,928	...	...	...	...	19.7	13.4	11.6	3.2	7.9	7.6	...	1	16.9	91	69	61	34
513	"	1927-28	20	5.5	7.8	0.1	13.1	12	190	4.67	16.85	19.7	84.1	5.2	1,854	...	...	...	...	20.5	13.0	9.5	1.7	7.3	8.1	...	3.0	16.3	89	65	67	34
719	"	1928-29	20	8.7	8.6	0.6	17.1	44	191	4.30	16.85	20.2	71.0	5.8	1,434	20.1	116.8	4.0	2,350	20.4	10.3	12.0	3.7	6.3	7.8	...	2.1	16.2	91	63	69	34
1015	"	1929-30	20	10.2	8.6	0.3	18.3	10	198	4.78	16.85	19.8	66.2	4.5	1,707	20.2	124.7	2.7	2,519	20.2	12.1	11.6	2.5	7.7	8.0	...	3.0	16.2	90	65	63	30
1018	"	1930-31	20	7.5	7.9	0.5	15.3	18	197	4.65	17.98	20.0	95.0	4.2	1,900	20.4	134.0	4.3	2,734	19.9	13.6	10.0	1.2	7.5	7.7	...	2.3	17.3	86	70	68	35
104	Surat 1927 A.L.F.	1923-24	20	6.3	8.0	0.6	14.3	10	182	4.12	16.85	19.8	75.1	6.1	1,487	...	...	...	...	10.9	8.9	0	5.7	9.2	...	1.2	...	86	69	49	30	
83	"	1924-25	20	5.2	7.6	0.4	12.8	8	181	4.00	14.85	19.3	98.0	4.1	1,853	...	...	...	...	19.9	9.6	1.0	5.9	11.6	...	1.2	...	86	70	64	32	
116	"	1925-26	20	5.3	7.2	0.6	12.6	15	182	4.12	16.85	19.9	72.8	8.9	1,440	...	...	...	...	19.9	11.9	4.2	6.6	9.5	...	2.1	...	86	65	65	30	
248	"	1926-27	20	6.1	7.2	0.4	13.3	10	192	4.39	14.85	19.6	88.1	4.2	1,727	...	...	...	...	19.9	11.9	4.2	6.6	9.5	...	2.1	...	86	65	65	30	
363	"	1927-28	20	3.6	7.7	0.2	11.2	0	190	5.00	16.85	20.0	79.0	6.9	1,580	...	...	...	...	20.3	10.5	9.8	0.2	6.7	6.7	...	2.0	16.2	89	64	64	30
487	"	1928-29	20	4.6	7.5	0.2	11.9	7	190	4.44	16.85	19.5	95.8	4.2	1,868	19.8	133.6	3.4	2,645	19.9	12.5	9.2	0.7	7.0	7.6	...	3.1	16.4	85	59	64	30
716	"	1929-30	20	3.8	7.4	0.3	10.8	17	196	4.55	16.85	19.4	97.1	5.0	1,881	19.8	130.1	2.6	2,778	20.0	11.8	11.9	5.7	4.6	7.3	...	2.1	16.2	91	58	62	34
1018	"	1930-31	20	3.6	6.8	0.6	10.8	8	200	4.49	16.85	19.9	81.2	4.9	1,610	20.2	119.0	3.0	2,404	20.9	9.8	11.7	3.7	6.3	7.4	...	3.3	16.2	89	58	68	30
100	Wagad 3	1925-26	14	8.3	12.8	0.4	20.2	13	174	6.85	15.97	13.7	84.7	7.5	1,160	...	...	...	...	12.5	9.9	1.5	6.2	9.8	...	1.2	14.7	87	81	82	12	
271	"	1926-27	14	7.4	8.4	0.4	15.5	3	166	6.89	15.08	14.0	88.4	6.0	1,238	...	...	...	...	14.4	11.8	12.9	5.5	7.9	7.3	...	1.2	14.9	87	78	72	14
372	"	1927-28	14	9.0	7.7	0.1	18.0	0	162	5.59	15.08	14.6	88.8	4.6	1,296	...	...	...	...	14.8	11.8	10.0	3.7	8.4	9.0	...	3.3	14.7	88	63	70	15
494	"	1928-29	14	5.4	7.6	0.2	12.8	10	164	5.74	15.08	14.3	92.4	4.8	1,321	10.5	238.8	2.7	2,265	14.8	12.5	9.6	1.5	8.2	7.2	...	3.3	14.5	88	65	71	15
698	"	1929-30	14	7.8	8.7	0.2	16.9	23	162	5.21	15.08	14.2	75.2	5.8	1,068	10.1	236.6	3.0	2,390	14.7	11.2	13.6	7.5	7.7	8.7	...	3.3	14.6	80	65	67	32
1003	"	1930-31	14	10.4	8.3	0.4	18.2	16	195	5.42	15.98	13.8	74.4	5.9	1,027	10.2	228.2	2.7	2,328	14.0	11.6	10.0	1.5	7.9	8.1	...	4	14.2	80	63	68	32
81	P. A. 4F	1924-25	20	7.9	7.3	1.2	15.7	22	181	5.27	16.85	19.3	65.1	6.8	1,256	...	...	...	...	8.7	33.6	7.0	4.7	17.5	...	1.4	...	73	75	61	22	
127	"	1925-26	20	6.7	6.5	0.4	13.1	2	180	4.60	16.85	19.5	67.7	7.3	1,320	...	...	...	...	9.3	12.3	5.5	5.2	16.3	...	1.4	...	91	69	58	30	
232	"	1926-27	20	9.5	8.5	0.3	18.4	10	191	5.32	16.85	19.8	75.2	4.6	1,489	...	...	...	...	20.2	10.1	10.7	8.5	8.9	6.6	...	3.1	16.5	88	63	78	24
340	"	1927-28	20	6.4	7.8	0.3	14.0	37	187	5.21	16.85	19.4	66.5	6.5	1,290	...	...	...	...	19.5	9.2	13.5	6.5	7.4	9.9	...	1.9	16				

TABLE 23 contd.—SUMMARY OF SPINNING TEST RESULTS ON STANDARD INDIAN COTTONS, 1923-31.
(b) UNITED PROVINCES, CENTRAL PROVINCES, AND HYDERABAD COTTONS.

1 Sample No.	2 Cotton.	3 Season.	4 Counts Nominal.	5-8 WASTE PERCENTAGES.				9-12 RING FRAME PARTICULARS.*				13-29 YARN TEST RESULTS.														30 TEMPERATURE (°F.)	31-32 RELATIVE HUMIDITY (%)		33 Highest Standard Warp counts.			
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	14-17 LEA.				18-21 BALLISTIC.				22-29 SINGLE THREAD.								Spinning Room.		Spinning Room.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%).	Extension Irregularity (%)		Evenness Class.					Neeps per Yard.	Turns per inch Actual.
				Spinning Room.	Spinning Room.	Testing Room.																										
22	Aligarh A. 19	1924-25	8	4.6	7.5	1.2	12.8	20	220	4.80	12.07	7.7	82.0	15.6	631	..	..	..	..	17.7	16.1	9.2	5.2	19.6	6	0	..	90	65	76	7
111	"	1925-26	8	5.0	8.0	1.3	13.7	55	200	5.00	12.07	7.8	108.8	7.9	849	..	..	..	..	17.0	15.2	10.0	7.1	11.4	3	0.7	..	83	64	65	8
227	"	1926-27	8	3.8	7.9	0.3	11.7	35	172	4.72	12.07	7.8	75.1	7.5	586	..	..	..	..	15.6	13.6	4.5	8.9	9.4	6	0.5	..	87	63	64	7
352	"	1927-28	8	3.1	7.9	0.5	11.2	10	180	5.20	12.07	7.9	87.9	8.3	694	..	..	..	..	15.0	16.8	11.0	7.4	9.4	4	0.7	11.8	81	65	54	7
482	"	1928-29	8	3.3	6.7	0.3	10.1	35	180	5.37	12.07	8.0	80.7	9.9	646	..	..	..	..	16.3	18.1	12.2	8.6	9.4	6	0.9	11.6	84	68	71	7
693	"	1929-30	8	2.4	7.9	0.3	10.4	55	183	4.95	12.07	7.9	79.3	8.0	626	8.1	217.6	4.4	1,762	8.0	15.3	18.7	9.3	11.8	5	1.1	11.7	85	65	67	7	
948	"	1930-31	8	3.6	9.9	0.6	13.7	53	180	4.76	12.07	8.1	84.5	5.8	684	8.2	236.6	3.3	1,940	8.4	15.3	14.7	8.6	11.3	4	0.6	11.5	81	68	68	7	
79	Cawnpore K. 22.	1924-25	10	8.4	7.7	0.4	15.9	35	211	5.27	12.63	9.5	117.2	8.6	1,113	..	..	..	..	19.7	13.2	5.0	7.3	10.7	5	1.7	..	76	75	54	12
129	"	1925-26	10	6.3	10.4	0.8	16.7	25	195	5.95	12.63	9.7	125.6	6.3	1,218	..	..	..	..	19.0	12.1	2.7	5.7	15.3	3	4.5	..	92	62	62	12
228	"	1926-27	10	4.0	6.9	0.4	10.9	5	198	5.38	12.63	9.7	107.1	4.3	1,039	..	..	..	..	16.5	14.3	7.5	8.7	7.6	4	1.0	..	88	67	65	12
351	"	1927-28	10	6.4	7.3	0.4	13.6	10	196	4.71	12.63	10.0	99.9	6.9	999	..	..	..	..	14.5	12.6	5.2	7.5	8.7	3	1.2	12.3	81	68	61	12
461	"	1928-29	10	5.9	7.9	0.2	13.5	5	192	4.35	12.63	10.5	118.8	4.4	1,247	..	..	..	..	18.0	10.0	12.2	7.8	6.6	3	1.6	12.3	83	68	71	14
648	"	1929-30	10	6.2	8.5	0.4	14.3	15	194	4.18	12.63	9.9	92.7	7.0	918	10.1	195.2	3.7	1,971	10.4	14.0	7.7	7.5	11.1	4	2.7	12.2	82	59	63	11	
946	"	1930-31	10	5.3	9.0	0.5	14.2	5	198	4.05	12.63	9.9	125.4	5.4	1,241	10.1	243.2	3.3	2,456	10.4	17.5	3.5	8.5	8.0	3	1.9	12.1	81	70	69	12	
78	Bundelkhand	1924-25	10	5.7	7.1	0.8	12.1	75	192	5.80	13.58	10.4	115.7	9.8	1,203	..	..	..	..	18.8	10.7	3.0	10.7	13.4	3	0.6	..	80	77	61	12
113	J. N. I.	1925-26	10	5.7	7.8	0.7	13.7	10	183	5.88	12.63	9.8	101.7	10.4	997	..	..	..	..	17.4	17.4	11.5	7.3	14.4	3	1.7	..	85	69	66	12
229	"	1926-27	10	7.1	7.2	0.3	14.2	5	206	4.88	12.63	9.9	118.5	6.7	1,173	..	..	..	..	17.9	14.0	5.5	9.2	8.6	3	0.6	12.4	90	66	79	14
350	"	1927-28	10	6.9	8.7	0.3	15.3	0	198	4.59	12.63	10.5	108.5	5.8	1,139	..	..	..	..	17.8	11.4	6.2	6.9	8.7	3	1.6	12.3	80	66	44	14
456	"	1928-29	10	5.0	7.0	0.3	12.0	10	197	4.55	12.63	10.4	107.1	6.4	1,114	..	..	..	..	15.3	14.3	6.0	8.4	8.8	3	0.9	12.2	83	63	70	13
690	"	1929-30	10	5.7	8.2	0.3	13.8	15	198	4.88	12.63	10.1	91.7	7.8	926	10.2	215.0	2.9	2,193	10.4	14.8	9.5	8.6	8.8	3	1.9	12.1	83	67	65	12	
979	"	1930-31	10	6.9	7.5	0.4	14.2	15	196	4.88	12.63	10.1	105.8	5.1	1,069	10.2	212.6	2.4	2,169	10.7	14.5	11.0	8.3	11.4	3	0.8	12.0	81	68	68	12	
77	Cawnpore C. A. 9.	1924-25	20	6.9	7.6	0.7	14.5	10	184	4.49	16.85	19.1	84.4	7.2	1,612	..	..	..	..	12.0	9.2	1.7	4.5	15.9	4	2.0	..	82	76	56	28
112	"	1925-26	20	6.6	9.4	0.5	15.8	17	182	4.00	16.85	19.0	83.5	6.0	1,587	..	..	..	..	11.6	10.3	2.7	5.7	10.4	3	3.1	..	84	64	66	28
231	"	1926-27	20	6.9	7.9	0.3	14.6	10	190	4.35	16.85	19.1	91.2	6.0	1,742	..	..	..	..	12.8	14.6	7.5	7.2	7.3	3	3.0	16.3	89	65	79	34
349	"	1927-28	20	6.7	8.6	0.3	15.0	7	193	4.25	16.85	19.9	76.6	5.7	1,524	..	..	..	..	19.5	12.8	8.7	7.2	10.5	3	3.2	16.2	82	67	68	30
457	"	1928-29	20	8.9	10.0	0.3	18.2	2	190	4.65	16.85	20.1	97.2	5.8	1,954	..	..	..	..	20.3	10.4	8.7	3.4	10.5	3	4.6	16.1	83	60	75	40
689	"	1929-30	20	4.7	8.8	0.3	13.3	17	186	4.39	16.85	19.5	94.7	5.3	1,847	19.8	130.2	3.0	2,578	20.2	13.3	2.0	6.8	9.1	3	2.9	16.1	82	64	65	34	
980	"	1930-31	20	7.0	8.0	0.4	14.8	5	196	4.44	17.98	20.1	101.9	3.5	2,048	20.1	137.9	4.1	2,772	20.9	14.0	0.5	7.1	6.8	2	2.7	17.4	81	68	67	37	
247	Verum 262 (Nagpur)	1926-27	20	8.6	10.7	0.4	18.6	2	180	6.76	16.85	20.4	60.0	9.5	1,224	..	..	..	..	10.6	12.0	1.0	7.2	7.0	4	2.1	..	88	68	62	24
346	"	1927-28	20	3.3	6.5	0.2	9.7	5	190	4.90	16.85	19.6	73.9	7.1	1,448	..	..	..	..	20.4	10.6	11.1	3.0	7.0	3	1.9	16.2	81	73	68	26
468	"	1928-29	20	7.6	10.2	0.3	17.4	10	182	5.26	16.85	19.4	72.0	9.6	1,397	..	..	..	..	14.5	6.5	6.2	8.7	4	3.3	16.2	84	60	72	26	
628	"	1929-30	20	4.3	6.3	0.5	10.8	40	190	4.90	16.85	20.0	59.1	8.1	1,182	..	..	..	..	20.6	10.0	17.0	7.4	9.3	3	2.8	16.4	81	66	72	21
962	"	1930-31	20	3.0	7.0	0.3	10.1	7	178	5.34	16.85	20.1	71.8	7.8	1,443	20.1	124.2	4.1	2,496	20.8	11.1	7.5	7.1	8.3	3	1.6	16.2	81	71	70	26	
320	Verum (Akola)	1927-28	20	6.5	6.5	0.2	12.8	10	180	5.32	16.85	19.2	57.5	7.8	1,104	..	..	..	..	19.7	9.3	6.0	6.3	6.8	3	1.2	16.3	81	64	61	19
35	"	1928-29	20	4.4	7.3	0.3	11.7	40	195	4.70	16.85	20.0	60.7	8.5	1,214	..	..	..	..	20.4	10.0	6.5	6.6	7.4	3	3.3	16.4	83	69	71	23
	"	1929-30	20	6.4	6.6	0.2	12.7	25	190	5.13	16.85	19.7	60.2	8.1	1,186	20.0	116.8	4.4	2,336	20.4	9.0	5.5	6.5	10.1	3	1.1	16.2	85	68	64	21	
	"	1930-31	20	4.4	7.7	0.6	12.4	77	185	5.20	16.85	19.5	55.4	9.2	1,080	19.7	117.5	3.8	2,315	20.7	8.9	8.7	6.7	7.7	3	2.6	16.0	83	64	66	18	
	"	1924-25	20	15.9	10.7	0.7	25.3	30	182	5.20	16.85	19.7	60.7	8.6	1,196	..	..	..	..	9.3	13.4	8.5	5.1	10.9	5	4.1	..	72	72	55	22
	"	1925-26	20	12.9	8.6	0.5	20.8	12	181	5.13	16.85	19.3	70.6	10.0	1,363	..	..	..	..	9.6	13.0	3.2	5.0	16.2	3	4.5	..	85	64	62	24
	"	1926-27	20	11.5	7.6	0.3	18.5	15	183	5.15	16.85	20.4	64.2	7.3	1,310</																	

TABLE 23 contd.—SUMMARY OF SPINNING TEST RESULTS ON STANDARD INDIAN COTTONS, 1923-31.

(c) MADRAS AND AMERICAN COTTONS.

Sample No.	Cotton.	Season.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.											Temp. Humidity (%).	Relative Humidity (%).	Standard	Warp														
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.			SINGLE THREAD.																					
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lb.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).					Weakness Percentage.	Extension (%).	Extension Irregularity (%).	Evenness Class.	Neps per Yard.	Turns per inch Actual.								
																																	Spinning Room.	Spinning Room.	Testing Room.					
105	Co. 1 (205)	1923-24	20	4.4	8.3	0.5	11.0	15	181	4.21	16.85	19.7	84.0	6.1	1,667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
84	"	1924-25	20	4.4	7.5	0.5	12.0	7	180	4.22	16.85	19.7	84.0	6.1	1,667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
126	"	1925-26	20	4.8	6.0	0.4	10.9	22	182	4.39	16.85	19.8	82.7	4.8	1,729	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
265	"	1926-27	20	4.0	6.7	0.2	12.5	22	192	4.78	16.85	19.8	108.7	3.9	2,053	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
374	"	1927-28	20	3.6	7.8	0.1	11.2	22	190	4.54	16.85	20.1	89.5	5.0	1,799	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
496	"	1928-29	20	4.4	6.4	0.3	12.6	10	196	4.47	16.85	19.5	88.5	4.5	1,726	19.9	136.8	4.1	2,631	19.7	12.0	8.7	0.7	8.0	7.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8		
785	"	1929-30	20	4.0	7.3	0.1	11.2	22	196	4.65	16.85	19.9	87.4	5.0	1,739	19.9	138.5	4.1	2,756	20.3	11.7	8.5	1.2	7.7	7.3	2.2	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7		
1049	"	1930-31	20	4.7	6.3	0.5	13.1	11	193	4.44	16.85	19.9	79.1	6.4	1,574	20.1	118.8	3.6	2,388	20.0	10.7	10.8	5.0	6.0	11.0	3	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
60	Co. 2 (440)	1924-25	20	2.5	11.5	1.1	12.4	37	186	4.08	16.85	19.3	83.3	8.9	1,649	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
124	"	1925-26	20	2.5	11.5	0.8	12.6	15	182	4.30	16.85	19.3	74.0	6.5	1,428
263	"	1926-27	20	2.5	11.5	0.4	13.2	22	189	4.44	16.85	19.6	97.1	3.4	1,903	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
375	"	1927-28	20	2.5	11.5	0.1	11.6	10	190	4.44	16.85	19.6	89.0	4.9	1,744	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
505	"	1928-29	20	2.5	11.5	0.4	14.1	10	191	4.44	16.85	19.4	75.3	4.6	1,461	10.8	110.5	3.3	2,188	20.3	12.6	8.5	2.0	7.5	7.4	1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
706	"	1929-30	20	2.8	7.2	0.2	10.1	9	180	5.00	16.85	20.0	78.9	4.8	1,578	20.1	122.6	3.3	2,464	20.7	10.5	9.6	1.5	7.9	6.8	3	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
1057	"	1930-31	20	5.9	6.7	0.8	14.5	3	200	3.67	16.85	19.9	77.8	3.6	1,548	20.1	121.2	2.3	2,436	20.6	10.0	8.5	0.7	7.8	7.3	8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
73	Nandyal 14	1923-24	20	5.9	7.5	0.9	13.7	10	192	4.35	16.85	19.3	93.5	6.0	1,895	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
74	"	1924-25	20	8.2	6.1	0.5	16.1	27	180	4.33	16.85	19.2	90.9	7.4	1,860	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
162	"	1925-26	20	8.6	8.9	1.0	17.6	22	179	4.27	16.85	19.3	77.2	8.8	1,529	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
273	"	1926-27	20	6.5	6.6	0.5	16.8	30	189	4.55	16.85	19.9	89.7	6.5	1,785	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
378	"	1927-28	20	7.3	8.7	0.4	15.7	10	192	4.52	16.85	19.6	81.9	6.6	1,695	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
506	"	1928-29	20	4.8	6.0	0.3	12.7	17	192	4.35	16.85	20.2	79.7	7.4	1,610	22.5	142.3	3.5	2,917	20.9	11.5	13.6	6.0	6.9	7.2	2	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1		
720	"	1929-30	20	2.6	7.0	0.6	10.0	40	202	4.73	16.85	20.0	90.1	5.9	1,692	20.2	140.4	3.4	2,836	20.2	12.7	12.9	3.7	6.8	6.3	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
1044	"	1930-31	20	5.3	7.6	0.4	12.9	11	197	4.44	16.85	19.3	91.7	5.8	1,816	20.2	145.4	3.4	2,937	20.2	11.6	12.0	3.7	6.3	6.2	3	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
65	Hagari 1	1924-25	20	4.5	10.2	0.5	14.6	5	183	4.49	16.85	19.6	83.1	4.8	1,620	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
140	"	1925-26	20	4.4	11.1	0.6	15.4	17	181	4.39	16.85	19.1	87.1	5.0	1,694	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
255	"	1926-27	20	2.6	7.7	0.3	10.4	12	190	4.30	16.85	19.2	83.4	5.2	1,661	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
507	"	1928-29	20	3.9	6.9	0.2	10.8	35	191	4.44	16.85	19.6	66.7	4.9	1,807	20.0	116.4	3.7	2,208	20.1	10.1	13.2	6.0	7.0	7.3	1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		
794	"	1929-30	20	3.2	6.8	0.4	10.1	42	200	4.30	16.85	19.4	81.0	7.1	1,671	19.7	139.2	3.2	2,565	20.1	11.8	9.8	0.7	8.0	7.8	3	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6		
1031	"	1930-31	20	1.6	5.0	0.4	6.9	3	198	4.55	16.85	19.9	94.1	4.6	1,873	20.3	137.6	4.2	2,793	20.9	11.8	9.8	1.5	6.7	7.1	8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
75	Hagari 25	1923-24	20	9.8	8.1	0.9	17.8	7	183	4.35	16.85	19.1	75.0	10.4	1,432	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
76	"	1924-25	20	5.4	7.1	0.4	12.3	12	183	4.44	16.85	19.5	87.4	6.9	1,704	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
168	"	1925-26	20	5.5	8.8	0.4	14.2	20	189	4.30	16.85	19.8	75.0	6.4	1,468	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
269	"	1926-27	20	5.1	8.6	0.6	13.7	14	193	4.44	16.85	20.0	75.4	6.5	1,508	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
377	"	1927-28	20	5.9	8.3	0.3	13.8	15	190	4.65	16.85	19.3	78.8	4.9	1,521	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
508	"	1928-29	20	5.5	13.2	0.5	18.3	7	194	4.70	16.85	19.3	93.5	3.0	1,804	20.2	130.7	5.8	2,640	20.0	11.8	10.5	3.5	7.3	7.9	2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2				
787	"	1929-30	20	5.1	6.4	0.2	11.4	17	189	4.44	16.85	19.3	75.1	5.5																										

Presented
by
JEHANGIR BOMANJEE PETIT.

14/11
5
August 1937.

Technological Bulletin
Series A, No. 39.



**Indian Central Cotton Committee
Technological Laboratory.**

**TECHNOLOGICAL REPORTS
ON
STANDARD INDIAN COTTONS,
1937**

BY

NAZIR AHMAD, M.Sc., Ph.D., F.Inst.P.,

Director, Technological Laboratory, Matunga, Bombay.



BOMBAY :
BRITISH INDIA PRESS
1937

PREFACE.

THE term "Standard Indian Cottons" is a certain improved varieties of cotton which are steadily replacing the older varieties in different parts of India and which, at present, cover some 15 per cent. of the total area under cotton cultivation. It is the practice at the Technological Laboratory to subject the standard cottons of each season to a very thorough test for their fibre-properties and yarn characteristics. The Technological Reports included in the present bulletin contain the detailed results of these tests on standard cottons of thirteen seasons, *viz.*, 1924-37, together with the Agricultural Details, the Grader's valuation reports and the Spinning Master's report on each cotton, while the objects and salient features of the various tests are described in the Introduction. Complete information regarding the treatment, waste percentages, yarn-breakages and the physical conditions prevailing in the Laboratory is also given in these reports. The general plan followed in each report is the same as in the past years with the following difference. The fibre tests for the determination of fibre-rigidity, ribbon-width and number of convolutions per inch have been discontinued, for reasons explained in the Introduction, after the 1932-33 season. On the other hand, the determination of the percentages of mature and immature fibres in each of the standard cottons was begun in 1934-35, and the results obtained since are included in this Bulletin. Furthermore, the methods and technique of fibre, yarn and spinning tests employed at the Technological Laboratory, instead of being described each year in the Introduction, have been dealt with, once for all, in a separate Technological Bulletin, Series A, No. 25.

In 1931-32 three cottons—one each from Bombay Presidency, Madras Presidency and U.P.—were omitted from these reports as they had either been replaced by superior types or gone out of general cultivation. In 1932-33, a U.P. cotton, K.22 was omitted because it failed to find favour with the cultivators, and a new U.P. cotton, C.402 was included. In 1933-34, two cottons, C.A.9 from U.P. and Hagari 25 from Madras Presidency were omitted from the list, the former because it was no longer grown on a commercial scale and the latter because it was replaced by Hagari 1. In 1934-35, four new cottons were included in these Reports. Two of these are from Sind, where as a result of the development of Sukkur Barrage, the area under cotton has increased considerably. The other two new cottons are further selections of the C.P. Verum 262 which have been evolved so as to give satisfactory results under special environmental and climatic conditions. This year marks the inclusion of a new Madras Cotton, namely Koilpatti 1, which is superior to Karunganni C7 in regard to bud and boll shedding under untimely rains, is more vigorous and produces an earlier crop. It should also be mentioned that until 1934-35 some of the samples of Jayawant cotton reported upon in this Bulletin were received from the Government Agricultural Farm, Dharwar, while others were obtained from the cultivators' fields. As this practice caused a certain amount of confusion, it has been discontinued and only the samples received from the Government Farm are reported upon in this Bulletin. The results for the four samples of American cottons have been deleted as these belonged to an old season (1929-30).

I have to acknowledge my great indebtedness to Messrs. W. Ellis Jones, C. P. Bramble and Varjivandas Motilal for their kindness in furnishing Grader's Reports, the Agricultural Officers for the supply of the samples of standard cottons together with relevant agricultural details, and the Spinning Masters (Messrs. R. P. Richardson and V. V. Gupte) and the staff of the Technological Laboratory for their co-operation in carrying out the tests and compiling the results described in these Reports.

N. A.

August 1937.

CONTENTS.

	PAGE
I. Introduction	1
Indian Cotton Crop	1
Work of the Agricultural Departments	1
Standard Cottons	3
Scope of the Reports	4
(i) Agricultural Details	4
(ii) Grader's Report	4
(iii) Fibre Properties	4
(iv) Spinning Tests	4
(v) Remarks	5
Size of the Sample	5
Objects of the Tests	5
II. Details of Fibre, Yarn and Spinning Tests	7
III. Physical Conditions	7
IV. Presentation of Results	8
V. Seasonal Variation of Standard Cottons	8
VI. Standard Cottons of 1936-37	11
VII. Technological Reports on Standard Indian Cottons—	
1. Jayawant—(Kumpta)	13
2. Gadag 1—(Dharwar-American)	17
3. Surat 1027 A. L. F.	21
4. Wagad 8—(Dholleras)	25
5. Sind-Sudhar	29
6. Sind-N. R.	33
7. Punjab-American 4F.	37
8. Punjab-American 289F.	41
9. Mollisoni (Bengals)	45
10. Aligarh A. 19—(Bengals)	49
11. C. 402 (U.P.)	53
12. (a) Verum 262 (Nagpur)	57
(b) Verum 262 (Akola)	61
13. V. 434 (Akola)	65
14. Late Verum (Nagpur)	69
15. Umri Bani	73
16. Cambodia Co. 2—(Cambodia 440)	77
17. Nandyal 14—(Northern)	81
18. Hagari 1—(Western)	85
19. Karunganni C7	89
20. Koilpatti 1	93
21. Summary of Fibre-Properties of Standard Indian Cottons—	
A.—English Units	97
B.—Metric Units	99
22. Summary of Spinning Test Results on Standard Indian Cottons—	
(a) Bombay and Sind Cottons	101
(b) Punjab Cottons	102
(c) U. P., C. P., and Hyderabad Cottons	103
(d) Madras Cottons	104

Indian Central Cotton Committee Technological Laboratory.

Technological Reports on Standard Indian Cottons, 1937.

BY

NAZIR AHMAD, M.Sc., Ph.D., F.Inst.P.

Director, Technological Laboratory, Matunga, Bombay.

I. INTRODUCTION.

Indian Cotton Crop.—The commercial cotton crop of India is composed of a great many varieties. Some of these are indigenous and have been grown in the country for a very long time, while the others are exotic and have been acclimatised by repeated cultivation and selection. These varieties differ considerably from one another as regards yield, ginning percentage, feel, colour, cleanliness, fibre-properties, spinning performance and yarn-characteristics. This is hardly surprising because, in a country of the size of India, the factors upon which the type and the quality of a cotton grown in any one area depend, *i.e.*, the climatic conditions, the amount and distribution of rainfall, the composition and fertility of the soil, etc., vary considerably from one area to another. It thus happens that on the one hand India produces the coarse and short-stapled Bengals, which are suitable for 8/10's reeling only, and on the other, the fine and long-stapled Cambodia, which is capable of spinning upto 30's warp or 40's weft. The table on page 2 gives the production and the staple length of the Indian cotton crop according to trade descriptions, the blow-room loss sustained by each cotton and the types of yarns for which it is suitable. This table is based upon a note on the characteristics of Indian cottons prepared by a joint Sub-Committee of the East India Cotton Association, Ltd., Bombay, and Indian Central Cotton Committee which has now been published under the title of "A Guide to Indian Cottons."

Work of the Agricultural Departments.—For many years the Agricultural Departments have pursued the policy of evolving new and improved varieties of cotton, which should be especially suited to the specific conditions prevailing in a given area. In this work they have been guided by the consideration that new variety should possess one or more of the following merits over the old one, which in due course should be superseded by the former in general cultivation. The new variety should either be less susceptible to attack by the particular disease or pest from which cotton in that area has suffered in the past, or it should give a bigger yield per acre and possess a higher ginning percentage as compared with the old variety. Or it should be characterised by possessing a longer and finer staple. Only if one or more of these conditions are fulfilled, can the new variety be confidently recommended to the farmers in the hope that it would give a better monetary return for their labours than the old variety. These are essentially the three principal directions along which improvement is aimed at by the Agricultural Officers engaged on selection and breeding of cotton.

These officers, for their research purposes, had isolated certain improved varieties, which were grown each season *from pure seed under as nearly the same conditions as possible*, and were employed as standards of reference. New selections, made from time to time, were compared with these as regards hardihood, yield, ginning percentage, resistance to disease and pests, quality of staple, etc. These improved varieties also provided the means for undertaking various physiological, botanical or agronomical experiments by the Agricultural departments. Many of them had distinctive merits over the local cottons, and in course of time as the farmers became acquainted with them, their cultivation spread from the experimental farms to the cultivators' fields and they came to be recognised as an integral part of the Indian Cotton Crop.

CHARACTERISTICS OF INDIAN COTTONS.

Hedge Contract.	Variety.	Production in Bales.	Staple Length.	Blow Room Loss (%).	Spinning Performance.	REMARKS.
BENGALS ..	United Provinces ..	190,000	Average 3/8"-5/8"	9-11	8's/10's reeling or weft	*Marketed as part of Punjab <i>Desi</i> Crop.
	Rajputana	120,000	" 3/8"-5/8"	9-11	Do.	
	Sind (<i>Desi</i>)	250,000	" 3/8"-5/8"	6-9	Do.	
	Punjab (<i>Desi</i>) ..	725,000	About 5/8"	9-11	Do.	
	Mollisoni*			7-9	8's/10's reeling	
Total	1,285,000					
BROACH ..	Broach	275,000	5/8"-6/8"	7-9	14's warp, 18's weft	Production mentioned is of roller-ginned cotton.
	Broach Farm ..	75,000		7-9	20's warp, 24's weft	
	Dharwar (Sawginned) ..	25,000	6/8"-7/8"	9-10	Upto 18's warp and 20's weft	
	Punjab-American 4F ..	550,000	3/4"-7/8"	8-10	20's warp	
	Sind-American 4F ..	75,000	7/8"-15/16"	8	26's warp	
	Sind-American NT ..	50,000	7/8"-1"	8	24's warp, 32's weft	
	Punjab-American 289F ..	10,000	1"-1 1/2"	9	Upto 30's warp or 40's weft	
	Surat	80,000	7/8"-31/32"	6-7	Upto 20's/24's warp	
	Surat 1027	50,000	About 1"	7-8	Upto 30's warp	
	Navsari	25,000	About 1"	6-7	Upto 28's warp	
Wagad	200,000	3/4"-7/8"	15	16-18's warp		
Lalia			5/8"-3/4"	12	14's warp	
Total	1,415,000					
OOMRAS ..	Berar	600,000	1/2"-6/8"	10	Upto 12's/14's reeling	Production includes about 30,000 bales of Banillas.
	Verum 262	25,000	7/8"	9	Upto 20's/24's warp	
	Central Provinces No. 1 ..	200,000	Average 5/8"-6/8"	7-8	Upto 12's/16's reeling	
	Central Provinces No. 2 ..	150,000	Do.	7-8	Upto 12's/14's reeling	
	Central India	250,000	5/8"-6/8"	11-12	Upto 14's/16's weft	
	Malvi	40,000	3/4"-7/8"	10	Upto 20's warp	
	Khandesh	350,000	Average 4/8"-5/8"	9-11	Upto 10's/12's reeling	
	Mathia	250,000	5/8"	15	Upto 10's/12's reeling	
	Hyderabad Gaorani ..	120,000	7/8"-15/16"	9-13	Upto 24's/26's warp	
Total	1,985,000					
SOUTHERNS ..	Westerns	200,000*	5/8"-13/16"	11-13	Upto 16's /20's warp	*Production includes 40,000 bales 'Mungari'; 120,000 bales 'Jowari' and 40,000 bales Western Farm.
	Western Farm (Hagari 1) ..		7/8"-15/16"	10-12	Upto 24's warp	
	Northerns	60,000	7/8"	8	Upto 22's warp	
	Nandyal 14		7/8"-15/16"	..	24's/26's warp	
	Coconadas	40,000	5/8"-13/16"	..	14's/16's warp	
	Kumptas	160,000	7/8"	14-16	Upto 22's warp	
	Jayawant		About 1"	12	26's/30's warp	
	Gadag No. 1	210,000	13/16"-15/16"	7-8	20's/24's warp	
Cambodia	90,000	7/8"-1"	6	Upto 24's/30's warp		
Tinnevelly	60,000	6/8"-7/8"	6-8	Upto 16's warp and 20's weft		
Karungannis	60,000	7/8"	6-8	Upto 24's warp		
Total	820,000					
GRAND TOTAL	5,505,000					

Standard Cottons.—When the task of giving to the cotton breeders authoritative valuations on new types of cotton devolved upon the Technological Laboratory of the Indian Central Cotton Committee, it was realised that it would be necessary to select, as standards of reference, certain cottons, which should include a few types from each Province. It was necessary that, so far as possible, these should be grown under similar conditions from pure seed and should be available without interruption in the successive seasons. As these conditions were eminently fulfilled by the agricultural standards referred to above, which, besides, were steadily gaining ground in general cultivation, these cottons were adopted as the Standard Cottons for the purposes of tests undertaken at the Laboratory. It should be noted that these agricultural standards have no relation *whatever* with the trade standards maintained by the East India Cotton Association or the Karachi Cotton Association for purposes of appeal and arbitration. These trade standards refer to the different contracts under which transactions in cotton are regulated and the various standards under the same contract are prepared in regard to the degree of cleanliness and brightness of a cotton. The agricultural standards, on the other hand, are mostly botanically pure types which are selected with special reference to yield, ginning out-turn, fibre-properties and spinning performance. The following list gives the distribution of these standard cottons according to the Provinces and shows for each cotton the season in which it was first tested at the Technological Laboratory and the area under its cultivation for the latest season. Ordinarily, the list of these agricultural standards remains unchanged for a considerable period of time, but when a cotton has definitely proved unfit for the cultivators' fields or has been superseded by a better variety, it is omitted from the list, and a new cotton is added to it, if, as a result of repeated trials, it is found suitable for general cultivation.

LIST.

<i>Cotton.</i>	<i>Season in which the cotton was first tested at the Technological Laboratory.</i>	<i>Area under cultivation under seed of known origin in 1936-37. (Acres).</i>
<i>Bombay Cottons.—</i>		
1. Jayawant (Kumpta)	1926-27	1,72,300
2. Gadag 1 (Dharwar-American)	1923-24	55,300
3. Surat 1027 A.L.F.	1923-24	3,25,000
4. Wagad 8 (Dholleras)	1925-26	780
<i>Sind Cottons.—</i>		
5. Sind Sudhar	1930-31	82,630
6. Sind N.R.	1929-30	About 2,00,000
<i>Punjab Cottons.—</i>		
7. Punjab-American 4F	1924-25	10,30,070
8. Punjab-American 289F	1924-25	23,935
9. Mollisoni (Bengals)	1925-26	9,58,370
<i>United Provinces Cottons.—</i>		
10. Aligarh A. 19 (Bengals)	1924-25	13,220
11. C. 402 (U.P.)	1931-32	1,350
<i>Central Provinces and Berar Cottons.—</i>		
12. (a) Verum 262 (Nagpur)	1926-27	} .. 70,000
(b) " (Akola)	1927-28	
13. " 434 (Akola)	1933-34	22,000
14. Late Verum (Nagpur)	1930-31	29,000
<i>Hyderabad Cotton.—</i>		
15. Umri Bani	1924-25	7,37,410
<i>Madras Cottons.—</i>		
16. Cambodia Co.2 (Cambodia 440)	1924-25	1,90,000
17. Nandyal 14 (Northerns)	1923-24	3,925
18. Hagari 1 (Westerns)	1924-25	2,00,000
19. Karunganni C7	1924-25	71,700
20. Koilpatti 1	1936-37	14,010

Scope of the Reports.—On being received at the Technological Laboratory the standard cottons are subjected to a very thorough examination for their fibre-properties, spinning performance and yarn-characteristics. Small representative samples are drawn for fibre tests, while, two lots, weighing 10 lbs. each, are processed for the spinning tests. Each lot is spun by itself, and the yarns obtained from it are tested independently. The detailed results of these tests will be found for each cotton in the Technological Reports which comprise the major part of this Bulletin. Each report is divided into the following five sections.

(i) *Agricultural Details.*—These are, as a rule, supplied by the Provincial Agricultural Departments, and provide information regarding the history, the district of growth, the sowing and picking periods, the type of soil, the climatic conditions, various plant particulars, *i.e.*, seed-weight, lint-weight per seed, ginning percentage, yield per acre of the seed cotton, and, finally, the area under cultivation in the different seasons. It should be remembered that the figures given under this section are either *averages* for several seasons or they are obtained under specified conditions. Care must, therefore, be exercised in drawing general conclusions from these figures as they are likely to vary considerably in the different seasons or under a set of different soil or climatic conditions.

(ii) *Grader's Report.*—This gives the Grader's estimate of the market value of each cotton and his opinion regarding its class, colour, staple length, staple strength and regularity, *i.e.*, factors in terms of which the trade interprets the quality of a cotton.

In regard to the price assigned by the Grader to a cotton, it should be remembered that it does not depend, in all cases, *solely* upon the quality and grade of the cotton, but may be influenced, to some extent, by various other factors. These factors are (1) the supply of the type in relation to the competing types, (2) the existence of an abnormally high or low demand for the type, (3) the existence of a general or prolonged strike in the textile industry or the threat of a boycott from large scale buyers, (4) the operations of a syndicate of buyers or sellers, etc. The operation of these factors, either singly or in conjunction, may force the price of a particular type up or down. It is important not to lose sight of these factors, as otherwise any generalisations based upon the grader's valuation alone may be quite erroneous and misleading.

(iii) *Fibre-Properties.*—This section contains the results of tests carried out for the determination of the following fibre-properties:—mean fibre-length (by two methods), fibre-length irregularity, fibre-weight per inch, fibre-strength (by two methods), fibre-strength per unit fibre-weight per inch, fibre-rigidity, ribbon-width, number of convolutions per inch and the percentage of mature, half-mature and immature fibres. The determination of fibre-rigidity, ribbon-width and number of convolutions has been discontinued from 1931-32, while the results of the maturity test are given from the 1934-35 season. It also includes a sorter diagram for each cotton, which not only gives an idea of the relative proportions of fibres of different length-grades present in it but also shows any appreciable change in its mean fibre-length as compared with the previous season or the average of the earlier seasons.

(iv) *Spinning Tests.*—This section contains an account of the treatment given to each cotton, the Spinning Master's report on its behaviour, the waste losses sustained by it in the blow-room and the card-room, the number of yarn-breakages in the ring frame, and the results of tests on yarns spun from it for strength (*lea*, single thread and ballistic), actual counts, number of turns per inch, yarn regularity, evenness and neppiness. The physical conditions of humidity and temperature prevailing in the spinning room and the testing room are also given in the tables.

(v) *Remarks.*—The results of the two previous sections are summarised and discussed with special reference to waste percentages, quality of yarn and seasonal variation in the fibre-properties and spinning performance of the cotton.

Size of the Sample.—In a technological laboratory established with the primary object of testing annually a large number of samples on behalf of the Agricultural Departments and the trade, the normal size of a sample is a matter of considerable importance. The question, therefore, arises: "What is the *minimum* size of a sample required for a reliable test?" Before we can find a satisfactory answer to this question, we must consider two criteria which have direct bearing on this point. On the one hand, the size of the sample should be such that the results of the Laboratory test on a cotton should reflect its behaviour when spun in bulk under ordinary mill conditions. This is necessary because, if a new cotton has to be recommended for general cultivation, the opinion of the spinner on its performance would have considerable weight in determining its value in the market and hence its popularity with the grower. On the other hand, the quantity required for the Laboratory test must *not* be so large as to hamper the cotton breeders in their work of developing new strains. The importance of the second criterion will be realised from the fact that the limited area at the disposal of a cotton breeder has to be parcelled out between a number of promising strains. Now, it takes a cotton breeder at least three years to grow a few pounds of lint of a *new* strain. Therefore, if he is expected to supply a large quantity, say 100 lbs. of lint of each of his selections for a spinning test, not only will he have to wait for several years before he is in possession of information regarding their spinning performance, but he will also have to discard, for want of sufficient area and other facilities, several of his strains which, on trial, may prove quite satisfactory.

In view of these two diametrically opposed considerations elaborate tests were made in the beginning on samples of different sizes, ranging from 100 lbs. to 1 lb. As a result of these tests it was found that, with the special technique employed at the Laboratory, a 10-lb. sample was sufficient for a satisfactory spinning test. Accordingly, this is the weight of a sample required for an ordinary test; but, as the standard cottons occupy a special position, duplicate tests on two 10-lb. lots are made on each of these cottons.

In judging the suitability of the size of a sample it should also be borne in mind that the normal routine of the Laboratory is specially adapted for handling and testing of small samples. Though the same machines are used as in a mill, the plant is small and the staff is trained for work of this nature; it is, consequently, possible to give close and individual attention to each sample in the various stages of manufacture of yarn. Although the samples are spun in rather more favourable conditions than those prevailing in a mill and are, therefore, likely to give somewhat higher performance, these conditions are perfectly definite and reproducible. When, as is often the case, the object is to compare the performance of two or more cottons, the size of a sample is of secondary importance, provided it is the same for all the samples which are spun under similar conditions. Where the performance of a single cotton is to be considered, the results of the Laboratory test will still provide a useful guide to its performance in a mill. The only serious objection which can be levelled against using a small sample is that the scutcher lap may not be uniform and may, therefore, give rise to yarn which may not be representative of a large sample. This difficulty has been overcome by employing, in the preparation of the scutcher lap, a special routine which is described in another bulletin.*

Objects of the Tests.—Tests on standard Indian cottons are undertaken with the following four objects. In the first place, since these tests are made in each season on the same varieties grown under as nearly the same

* Technological Bulletin Series A, No. 25: "Testing of Indian Cottons for Quality."

conditions as possible, they serve to establish a scale of reference for the entire Indian cotton crop. For instance, we know, from the supplementary tests made for the trade, the performance of the commercial Punjab-American cotton grown in the districts in any one season. We also know from these Reports the performance of this cotton grown in the same season from pure seed on an experimental farm. By comparing the results of the two tests, we are in a position to determine the extent by which the commercial variety differs in quality from the pure cotton. If the difference is considerable, the next step would be to ascertain the causes which are responsible for it. If the two samples are not grown at the same place, allowance must, of course, be made for different environmental and climatic factors.

Secondly, since these tests are repeated in the successive seasons, the results obtained afford an excellent means for the study of seasonal variation in the fibre-properties and spinning performance of these cottons. This study of seasonal variation is valuable in two ways. In the first place, provided it is extended over a sufficiently long period of time, it gives us definite information regarding the *average* quality of the standard cottons and the maximum variation we may expect in any one season. In the second place, since the standard cottons have *not* been selected at random but with an eye to the geographical distribution of the commercial crop, their quality and its seasonal variation reflect, to some extent, at least the variation in the quality of the commercial crop.

The third purpose served by these tests is to furnish the necessary data for the correlation of fibre-properties of Indian cottons with their spinning performance. The importance of establishing a satisfactory relationship of this kind lies in the fact that the cotton breeder is anxious to know, at the earliest possible stage, which of his new strains are likely to prove acceptable to the spinner. The spinning test, which at present is the only satisfactory means of furnishing an answer to this question, suffers from two serious drawbacks. In the first place, it needs considerable capital expenditure on machinery and apparatus and the services of a trained staff, which render it outside the financial scope of most cotton breeders. Secondly, it imposes upon him severe restrictions as regards the minimum weight of lint required for a satisfactory test. These two factors effectively cut down the number of new strains which may be examined in any one season. It follows, therefore, that if it were possible to establish a satisfactory relationship between the fibre-properties and spinning performance of a cotton, it would enable the breeder to predict the latter from the former, effecting a considerable saving both in time and labour. It would make it possible for him to decide, after making tests on little more than a handful of lint, which of his selections are likely to appeal to the spinner. The problem is greatly complicated by the well-known susceptibility of cotton to climatic and soil conditions, and can only be tackled satisfactorily by the statistical method. For this purpose a few observations here and there are not enough; it is necessary to have the results of a systematic investigation extending over several seasons. As has already been mentioned, besides the spinning test, half a dozen fibre-properties were determined accurately for each standard cotton in each season. The accumulated results for several seasons provided just the kind of data required for solving the above-mentioned problem, and the measure of success achieved, together with the limitations of this method are discussed in another bulletin.*

The fourth purpose served by these tests is to place in the hands of the trade detailed information regarding the standard cottons. Many of these cottons have been evolved after years of scientific research and represent improved types which are becoming more and more popular with the cultivators. It is hoped that the present bulletin, containing all

* Technological Bulletin Series B, No. 17: The Prediction of the Spinning Value of a cotton from its fibre-properties.

the particulars required by a practical man, will help to give these cottons their proper place in the world's markets. It should be mentioned here that another bulletin, similar to the present one, is now published annually, which gives the results of tests on representative trade varieties which form the bulk of the Indian Cotton Crop.

II. DETAILS OF FIBRE, YARN AND SPINNING TESTS.

It has been customary in the past to give in each issue of this Bulletin full details of the machinery and the spinning technique employed in the spinning tests, of the apparatus and the methods employed in the fibre and the yarn tests and of the standards of yarn strength and twist adopted at the Technological Laboratory. The methods and technique of the routine tests undergo but little change from year to year. Therefore, in order to avoid repetition, a full account of these has been published in another Technological Bulletin.* The method employed for the determination of the percentages of mature and immature hairs, the results for which have now been included in these Reports, are described in another bulletin.†

In connection with the fibre tests, it should be mentioned that the determination of fibre-rigidity, ribbon-width and number of convolutions per inch, for the standard Indian cottons, has been discontinued from the 1932-33 season. Statistical analysis of the data for nearly 150 cottons of the previous 10 seasons showed that the influence of any one of these properties on the spinning quality of a cotton was insignificantly small as compared to that of mean fibre-length, fibre-weight per inch or, to a lesser degree, fibre-strength, and that the additional information yielded by a knowledge of these properties with regard to the spinning quality of a cotton is incompatible with the extra time and labour involved in their determination. Accordingly, examination of fibres for these properties was discontinued, except in special cases, from that season. On the other hand, in view of the valuable information yielded by a knowledge of the degree of maturity of the cotton fibre, maturity tests have been made on the standard cottons since 1934-35, and these, along with the tests for fibre-length, fibre-weight per inch and fibre-strength, will be repeated in the following seasons. It should be also mentioned here that upto 1929-30 the fibre-weight was determined by weighing 1 cm. lengths of fibres. Since then, for reasons explained in another bulletin‡ it has been determined by weighing whole fibres. The latter method gives, on the average, about 10% lower result than the former. Furthermore, since the value of the fibre-weight per inch is used in the calculation of the intrinsic strength, a *negative* correction of about 10% should be applied to its values subsequent to 1929-30 to make them comparable to the earlier seasons.

III. PHYSICAL CONDITIONS.

Each room of the Technological Laboratory is equipped with at least one thermo-hygrograph for taking a continuous record of the humidity and the temperature prevailing in the room. These thermo-hygrographs are checked every hour against a wet and dry bulb whirling hygrometer. Thus, complete information regarding the psychrometric state of the atmosphere in each room is available from day to day. It has been found that, over short period of time, variation in humidity and temperature is generally quite small in Bombay; though, of course, the average humidity is much higher during the rainy (monsoon) season than during the dry months. We know that such fibre-properties as weight, strength, rigidity, etc., are highly susceptible to fluctuations in humidity. In order to have a uniform basis of comparison, it is, therefore, necessary to

* Technological Bulletin Series A, No. 25.

† Technological Bulletin Series B, No. 20: Fibre-Maturity in relation to fibre and yarn characteristics of Indian cottons.

‡ *Ibid.*

reduce the observed values to a standard humidity. The standard humidity adopted at the Technological Laboratory is 70% R.H.; and the corrections applied to each of the fibre-properties mentioned above for actual higher or lower humidities are given in tabular form in Technological Bulletin Series A, No. 25. Since all values of fibre-properties given in this Bulletin have already been corrected for humidity, wherever necessary, it is unnecessary to give the humidity data for the fibre-testing section in the tables of fibre-test results. During the dry weather the relative humidity in the spinning room and the yarn-testing room is maintained as near 70% as possible by means of a humidifying plant. The relative humidities given in column 31 of the tables of spinning test results are the average values for the time during which a cotton remains on the ring frame. In the yarn-testing room the procedure adopted is as follows: For the lea test and the ballistic test the relative humidity is read just before and just after the test. If from the thermo-hygrograph record, the humidity is found to be fluctuating rapidly, which is rarely the case, a third reading is taken during the test. For the single thread test, the humidity is noted at the beginning and at the end of the tests on each bobbin, and the mean of these two values is taken as the humidity for that bobbin, giving in all 10 values for each count. The average value prevailing during the lea test, the ballistic test and the single thread test is shown against each count in column 32 of the tables of spinning test results. As the various yarn tests on any one count are performed either simultaneously or within a short interval of time, during which fluctuations in humidity are small, the above procedure does not seem open to any serious objection. If all the humidity data relating to the processing and testing of each cotton were included in these reports, it would make them unwieldy and tiresome.

IV. PRESENTATION OF RESULTS.

The general plan of the Technological reports on standard Indian cottons has already been described on page 4. It only remains to be stated that in the Tables of spinning test results, 1-19, the average for each count of all the results obtained for a cotton upto the 1927-28 season is given instead of the individual values for each season. After 1927-28, the mean for both lots is given for each season, while for the latest season, 1936-37, the results for each lot are shown separately. The waste percentages are shown against 20's or 10's counts, but, as the same rovings are used in the preparation of the other counts into which a cotton is spun, it follows that the blow-room loss and the card-room loss would be the same for any one of the other counts. The figures for "spinning loss," however, are for the total loss sustained in the spinning of all the counts and refer to small samples weighing 10 lbs. each. In the case of a bulk sample spun under mill conditions, the card-loss would be somewhat less, while the spinning loss would be appreciably higher than that shown in the tables. It is important to bear these points in mind, as otherwise erroneous ideas may be formed as regards the waste losses to be expected from these cottons. The Spinning Master's Reports on these cottons are now presented in tabular form so that any variation in the appearance, feel, etc., of a cotton, as revealed by the hand-and-eye examination, may readily be followed from season to season.

The Bulletin is brought to a close by two tables which give, in a summary form, the results for all the standard cottons tested in the different seasons. Table 21 contains the results of fibre tests on standard cottons from 1926-27 onwards, while table 22 contains the results of spinning tests for all seasons for a standard count (20's wherever possible) spun with moderate twist. In 1923-24 season a number of lots, including one 10-lb. lot, were spun for most cottons and the waste percentages for this season refer to the single 10-lb. lot, but the other particulars are the means of the value for the 10-lb. and the 100-lb. lots.

V. SEASONAL VARIATION OF STANDARD COTTONS.

The seasonal variation in the fibre-properties and the spinning quality of a cotton is discussed in the "Remarks" section in each report. The following three tables have been constructed with the object of

bringing out the degree of variability of the different cottons. They contain a summary of the results for (1) mean fibre-length, (2) mean fibre-weight per inch, and (3) the highest standard warp counts for which these cottons have been adjudged suitable in the different seasons. In each table the cottons have been divided into three classes according as they are slightly variable, variable, or very variable with respect to any one of the three properties mentioned above. The criteria of variability adopted for this purpose are as follows :—

Fibre-length :	Slightly variable : below 2 per cent. Variable : 2-3 per cent. Very variable : above 3 per cent.
Fibre-weight per inch :	Slightly variable : below 6 per cent. Variable : 6-10 per cent. Very variable : above 10 per cent.
Highest standard counts :	Slightly variable : below 6 per cent. Variable : 6-10 per cent. Very variable : above 10 per cent.

Seasonal Variation in Fibre-Length.

Cotton.	Province or State.	Mean Fibre-Length (inch.)												Grand Mean (inch.)	Co-efficient of Seasonal Variation (%)		
		1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.			1936-37.	
<i>I.—Slightly Variable.</i>																	
Lato Verum (Nagpur)	C.P.	0.89	0.88	0.86	0.87	0.86	0.86	0.87	0.870	1.23
Karunganni C7	Madras	0.84	0.83	0.85	0.85	0.82	0.84	0.82	0.82	0.86	0.82	0.83	0.83	0.84	0.835	1.59	
<i>II.—Variable—</i>																	
Cambodia Co. 2	Madras	0.92	0.92	0.94	0.88	0.92	0.90	0.92	0.90	0.92	0.88	0.92	0.88	0.92	0.909	2.18	
Umri Bani	Hyderabad	0.86	0.83	0.82	0.82	0.84	0.81	0.80	0.79	0.81	0.83	0.82	0.82	0.82	0.821	2.14	
Akola Verum	C.P. .. ..	..	..	..	0.83	0.84	0.84	0.80	0.78	0.82	0.80	0.80	0.80	0.79	0.810	2.60
Wagad 8	Bombay .. ..	..	0.79	0.80	0.77	0.80	0.76	0.78	0.80	0.84	0.80	0.78	0.78	0.81	0.792	2.65
C402	United Provinces .. ..	..	..	..	..	..	..	..	0.80	0.79	0.76	0.81	0.81	0.82	0.798	2.82
Jayawant	Bombay .. ..	..	..	0.88	0.88	0.96	0.92	0.96	0.93	0.92	0.90	0.94	0.94	0.92	0.923	2.99
<i>III.—Very Variable—</i>																	
Gadag 1	Bombay	0.81	0.82	0.81	0.86	0.82	0.84	0.88	0.80	0.81	0.81	0.79	0.84	0.80	0.822	3.16	
1027-A.L.F.	Bombay	0.95	0.92	0.93	0.94	0.96	0.97	0.94	0.90	0.94	0.99	0.96	1.01	0.92	0.952	3.21	
P. A. 289F	Punjab	1.02	1.00	0.97	0.94	0.96	1.00	0.96	0.90	0.95	0.94	0.94	0.97	0.96	0.962	3.26	
Mollisoni	Punjab .. ..	..	0.72	0.68	0.73	0.69	0.69	0.69	0.70	0.74	0.68	0.72	0.75	0.72	0.709	3.37
Nandyal 14	Madras	0.89	0.88	0.94	0.88	0.92	0.92	0.86	0.85	0.91	0.89	0.94	0.92	0.86	0.897	3.33	
Nagpur Verum	C.P. .. ..	..	..	0.84	0.88	0.86	0.81	0.82	0.83	0.82	0.77	0.83	0.82	0.80	0.825	3.53
Hagari 1	Madras	0.86	0.82	0.82	..	0.84	0.84	0.91	0.86	0.82	0.80	0.83	0.90	0.86	0.847	3.91	
P. A. 4F	Punjab	0.80	0.82	0.78	0.79	0.76	0.82	0.77	0.72	0.78	0.73	0.82	0.80	0.76	0.781	4.16	
A. 19	United Provinces	0.72	0.72	0.66	0.70	0.72	0.68	0.66	0.66	0.67	0.64	0.66	0.66	0.65	0.677	4.19	
Sind, Sudhar	Sind .. ..	..	..	..	..	..	..	0.88	0.92	0.90	1.02	0.97	0.94	0.85	0.954	4.19
Sind, N. B.	Sind .. ..	..	..	..	..	..	0.69	0.62	0.68	0.62	0.70	0.70	0.69	0.68	0.672	4.95

Seasonal Variation in Fibre-Weight per inch.

Cotton.	Province or State.	Mean Fibre-Weight per inch (10-6 oz.)					Grand Mean (10-6 oz.) (1924-29)	Mean Fibre-Weight per inch (10-6 oz.)								Grand Mean (10-6 oz.) (1929-37)	Co-efficient of Seasonal Variation (%) (1929-37)
		1924-25.	1925-26.	1926-27.	1927-28.	1928-29.		1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.		
I.—Slightly Variable.																	
Hagari 1	Madras	0.171	0.146	0.209	..	0.207	0.183	0.175	0.166	0.172	0.175	0.171	0.167	0.170	0.180	0.172	2.5
Late Verum (Nagpur)	C.P. .. ..	..	..	..	..	..	..	..	0.184	0.181	0.184	0.175	0.189	0.186	0.176	0.182	2.8
Nagpur Verum	C.P. .. ..	..	..	0.185	0.216	0.215	..	0.166	0.186	0.176	0.180	0.188	0.183	0.193	0.182	0.182	4.5
Karunganni	Madras	0.164	0.173	0.192	0.183	0.186	0.180	0.181	0.161	0.181	0.167	0.164	0.167	0.157	0.170	0.168	5.2
II.—Variable—																	
Umri Bani	Hyderabad	0.134	0.134	0.200	0.192	0.185	0.189	0.152	0.175	0.172	0.175	0.166	0.169	0.160	0.168	0.170	6.3
Nandyal 14	Madras	0.179	0.176	0.191	0.196	0.187	0.186	0.169	0.167	0.187	0.156	0.163	0.171	0.153	0.163	0.166	6.3
Gadag 1	Bombay	0.154	0.150	0.179	0.167	0.162	0.162	0.148	0.153	0.154	0.134	0.153	0.147	0.162	0.190	0.152	6.4
1027 A.L.F.	Bombay	0.204	0.237	0.200	0.207	0.204	0.210	0.180	0.201	0.175	0.190	0.169	0.183	0.168	0.193	0.182	6.5
A. 19	U.P.	0.287	0.303	0.301	0.305	0.324	0.304	0.277	0.301	0.314	0.290	0.262	0.271	0.264	0.275	0.282	6.5
Sind Sudhar	Sind .. ..	..	..	..	..	..	..	..	0.146	0.126	0.129	0.131	0.127	0.147	0.133	0.135	6.6
Mollisoni	Punjab .. ..	..	0.321	0.272	0.335	0.303	0.308	0.272	0.237	0.242	0.274	0.282	0.268	0.264	0.309	0.275	7.0
Akola Verum	C.P. .. ..	..	..	..	0.210	0.187	..	0.176	0.170	0.174	0.163	0.184	0.165	0.195	0.195	0.178	7.0
Cambodia Co. 2	Madras	0.172	..	0.168	0.141	0.148	0.167	0.136	0.133	0.145	0.123	0.122	0.132	0.152	0.136	0.135	7.5
C402	U.P. .. ..	..	..	..	..	..	..	..	..	0.204	0.185	0.181	0.164	0.184	0.168	0.183	8.4
Wagad 8	Bombay .. ..	..	0.253	0.264	0.189	0.239	0.237	0.195	0.257	0.225	0.240	0.199	0.232	0.216	0.221	0.223	9.2
III.—Very Variable—																	
4F	Punjab	0.177	0.174	0.134	0.186	0.187	0.174	0.155	0.198	0.161	0.143	0.140	0.142	0.175	0.157	0.159	10.6
289F	Punjab	0.125	0.125	0.098	0.142	0.122	0.122	0.142	0.142	0.122	0.114	0.119	0.120	0.152	0.124	0.129	10.8
Sind, N. E.	Sind .. ..	..	..	..	..	..	..	0.349	0.333	0.307	0.299	0.293	0.263	0.257	0.272	0.297	11.0
Jayawant	Bombay .. ..	..	..	..	0.193	0.207	..	0.181	0.175	0.183	0.194	0.147	0.140	0.150	0.189	0.170	12.3

Seasonal Variation in Highest Standard Warp Counts.

Cotton.	Province or State.	Highest Standard Warp Counts.													Grand Mean	Co-efficient of Seasonal Variation (%)	
		1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.			
I.—Slightly Variable.																	
Jayawant	Bombay .. ..	..	..	33	33	33	40	37	40	36	38	42	42	41	39.1	5.2
II.—Variable.																	
Late Verum (Nagpur)	C.P. .. ..	..	..	..	..	..	..	30	29	31	34	36	33	31	32.0	7.7
Nagpur Verum	C.P. .. ..	..	..	24	26	26	21	26	25	23	24	28	23	25	24.6	7.8
Sind Sudhar	Sind .. ..	..	..	..	..	..	..	42	42	50	50	43	45	42	44.9	8.2
Akola Verum	C.P. .. ..	..	..	..	19	23	21	18	21	25	21	22	20	23	21.3	9.7
A. 19	United Provinces	7	8	7	7	7	7	7	6	6	6	6	6	6	6.6	9.9	
III.—Very Variable.																	
1027 A.L.F.	Bombay	32	26	32	30	32	34	29	30	31	37	34	34	26	31.3	10.1	
P. A. 289F	Punjab	34	32	40	42	39	42	44	39	44	45	44	45	44	41.1	10.2	
Hagari 1	Madras	30	30	27	..	24	27	36	30	25	23	29	30	30	28.8	10.7	
Nandyal 14	Madras	32	32	34	31	31	35	35	39	37	37	40	40	42	35.1	11.1	
Wagad 8	Bombay .. ..	..	12	14	15	15	12	12	16	13	16	14	12	13	13.7	11.4
Mollisoni	Punjab .. ..	..	6	8	8	7	8	8	8	10	8	9	8	7	7.9	12.6
Cambodia Co. 2	Madras	29	25	37	33	26	23	29	27	24	26	30	30	33	29.0	12.7	
Umri Bani	Hyderabad	22	24	24	24	22	27	23	27	28	29	30	34	30	26.8	13.2	
P. A. 4F	Punjab	22	22	24	22	16	20	22	20	25	24	27	28	27	22.9	13.7	
Karunganni C7	Madras	26	26	24	24	20	23	26	21	23	25	23	23	34	24.8	14.1	
Gadag 1	Bombay	20	30	33	33	26	32	35	29	30	30	33	29	30	30.8	15.5	
Sind, N. E.	Sind .. ..	..	..	..	..	..	6	6	6	6	8	9	7	7	6.9	16.3
C402	United Provinces	15	14	19	22	16	23	18.0	20.8

In the table showing the seasonal variation in fibre-weight per inch the grand mean and the co-efficient of seasonal variation are calculated for samples received after 1928-29. Owing to a change in the method of the determination of the mean fibre-weight per inch introduced in 1929-30 to which a reference has been made above, the values for the subsequent seasons are not strictly comparable with those for the earlier seasons.

It will be seen that there is very little correspondence between the degree of variability of the standard Indian cottons with respect to all the three above-mentioned properties. Cottons which are "slightly variable" in regard to one property are "variable" or even "very variable" with respect to the other two, the only exceptions being P.A. 4F, Sind N.R. and P.A. 289F which are "very variable" with respect to all the three properties. However, if we consider only two fibre-properties at a time, we can pick out many cottons which fall in the same class as regards variability. Among such pairs it is interesting to note that correspondence between variation in mean fibre-length and the highest standard warp count is more frequent than that between the other two pairs. This brings out indirectly the closer association of spinning performance and mean length in the case of the Indian cottons. It will also be seen that although occasionally there may be large fluctuations in the highest standard warp counts for which these cottons are adjudged suitable, there is no evidence of a steady deterioration of quality in any of them during the last ten seasons. It is necessary to emphasise this point as misleading statements based upon insufficient and unreliable data are sometimes made by ill-informed people to the effect that the Indian cotton crop is deteriorating in quality from year to year.

VI. STANDARD COTTONS OF 1936-37.

The results of the various fibre and yarn tests made on these cottons together with details of machinery and treatment, etc., will be found in the Technological reports in the following pages. A few general remarks may be made here on the performance of the 1936-37 cottons as compared with those of the last few seasons. It was stated in a former issue of this Bulletin that the standard cottons of 1930-31 gave, on the whole, much better performance than those of 1929-30 but that this improvement was not maintained in the following season. The set-back, however, proved temporary, as the 1932-33 cottons gave on the whole better performance than those of 1931-32. This improvement was maintained in the following two seasons and in 1934-35 the cottons generally gave even better results than in 1933-34. Thus, since 1930-31 the spinning performance of these cottons showed a steady improvement with a few exceptions. This improvement, however, suffered a set-back in the 1935-36 season, from which there is a welcome change for the better to some extent, in the current season. In order to concentrate our attention on the current and the last season, the following table has been prepared in which these cottons have been divided into three classes, *viz.*, those which gave better performance (column 1), those which gave the same performance (column 2), and those which gave a poorer performance (column 3) as compared with the last year's samples. The highest standard warp counts for which these cottons are adjudged suitable have been adopted as an index of spinning performance in each case:—

1	2	3
Better.	Same.	Poorer.
Wagad 8 P.A. 4F. C. 402. Verum 262 (Nagpur) " " (Akola). Cambodia Co. 2. Nandyal 14. Karunganni C7.	Gadag 1. Sind N.R. A. 19. Hagari 1.	Jayawant. Surat 1027 A.L.F. Sind Sudhar. P.A. 289 F. Mollisoni. V434 (Akola). Late Verum (Nagpur). Umri Bani.

Seasonal Variation in Fibre-Weight per inch.

Cotton.	Province or State.	Mean Fibre-Weight per inch (10-6 oz.)					Grand Mean (10-6 oz.) (1924-29)	Mean Fibre-Weight per inch (10-6 oz.)								Grand Mean (10-6 oz.) (1929-37)	Coefficient of Seasonal Variation (%) (1929-37)
		1924-25.	1925-26.	1926-27.	1927-28.	1928-29.		1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.		
I.—Slightly Variable.																	
Hagari 1	Madras	0.171	0.146	0.209	..	0.207	0.183	0.175	0.166	0.172	0.175	0.171	0.167	0.170	0.180	0.172	2.5
Late Verum (Nagpur)	C.P. .. ..	..	..	..	..	..	..	0.184	0.181	0.184	0.175	0.169	0.186	0.176	0.182	0.182	2.8
Nagpur Verum	C.P. .. ..	..	..	0.185	0.216	0.215	..	0.166	0.186	0.176	0.180	0.188	0.183	0.193	0.182	0.182	4.5
Karunganni	Madras	0.164	0.173	0.192	0.193	0.186	0.180	0.181	0.161	0.181	0.167	0.164	0.167	0.157	0.170	0.168	5.2
II.—Variable—																	
Umri Bani	Hyderabad	0.184	0.184	0.200	0.192	0.185	0.189	0.152	0.175	0.172	0.175	0.166	0.169	0.160	0.188	0.170	6.3
Nandyal 14	Madras	0.179	0.176	0.191	0.196	0.187	0.186	0.169	0.167	0.187	0.156	0.163	0.171	0.153	0.163	0.166	6.3
Gadag 1	Bombay	0.154	0.150	0.179	0.167	0.162	0.162	0.148	0.153	0.154	0.134	0.153	0.147	0.162	0.156	0.152	6.4
1027 A.L.F.	Bombay	0.204	0.237	0.200	0.207	0.204	0.210	0.180	0.201	0.175	0.190	0.169	0.188	0.168	0.193	0.182	6.5
A. 19	U.P.	0.287	0.303	0.301	0.305	0.324	0.304	0.277	0.301	0.314	0.290	0.262	0.271	0.264	0.275	0.282	6.5
Sind Sudhar	Sind .. ..	..	..	..	..	..	..	..	0.146	0.120	0.129	0.131	0.127	0.147	0.138	0.135	6.6
Mollisoni	Punjab .. ..	..	0.321	0.272	0.335	0.303	0.308	0.272	0.287	0.242	0.274	0.282	0.268	0.264	0.309	0.275	7.0
Akola Verum	C.P. .. ..	..	..	..	0.210	0.187	..	0.176	0.170	0.174	0.163	0.184	0.165	0.195	0.195	0.178	7.0
Cambodia Co. 2	Madras	0.172	..	0.168	0.141	0.148	0.167	0.136	0.133	0.145	0.123	0.122	0.132	0.152	0.136	0.135	7.5
C402	U.P. .. ..	..	..	..	..	..	..	..	..	0.204	0.195	0.181	0.164	0.184	0.168	0.183	8.4
Wagad 8	Bombay .. ..	..	0.258	0.264	0.189	0.239	0.237	0.195	0.257	0.225	0.240	0.199	0.232	0.216	0.221	0.223	9.2
III.—Very Variable—																	
4F	Punjab	0.177	0.174	0.134	0.186	0.197	0.174	0.155	0.198	0.161	0.143	0.140	0.142	0.175	0.157	0.159	10.6
289F	Punjab	0.125	0.125	0.098	0.142	0.122	0.122	0.142	0.142	0.122	0.114	0.119	0.120	0.152	0.124	0.129	10.8
Sind, N. R.	Sind .. ..	..	..	..	..	..	..	0.349	0.333	0.307	0.299	0.293	0.263	0.257	0.272	0.297	11.0
Jayawant	Bombay .. ..	..	..	..	0.193	0.207	..	0.181	0.175	0.183	0.194	0.147	0.140	0.150	0.189	0.170	12.3

Seasonal Variation in Highest Standard Warp Counts.

Cotton.	Province or State.	Highest Standard Warp Counts.														Grand Mean	Coefficient of Seasonal Variation (%)
		1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.			
I.—Slightly Variable.																	
Jayawant	Bombay .. ..	..	..	38	38	33	40	37	40	36	38	42	42	41	39.1	5.2
II.—Variable.																	
Late Verum (Nagpur)	C.P. .. ..	..	..	..	..	..	..	30	29	31	34	36	33	31	32.0	7.7
Nagpur Verum	C.P.	24	26	26	21	26	25	23	24	28	23	25	24.6	7.8
Sind Sudhar	Sind .. ..	..	..	..	..	..	..	42	42	50	50	43	45	42	44.9	8.2
Akola Verum	C.P.	19	23	21	18	21	25	21	22	20	23	21.3	9.7
A. 19	United Provinces	7	8	7	7	7	7	7	7	6	6	6	6	6	6.6	9.9	
III.—Very Variable.																	
1027 A.L.F.	Bombay	32	26	32	30	32	34	29	30	31	37	34	34	26	31.3	10.1	
P. A. 289F	Punjab	34	32	40	42	39	42	44	39	44	45	44	45	44	41.1	10.2	
Hagari 1	Madras	30	30	27	..	24	27	36	30	25	28	29	30	30	28.8	10.7	
Nandyal 14	Madras	32	32	34	31	31	35	35	30	37	37	40	40	42	35.1	11.1	
Wagad 8	Bombay .. ..	..	12	14	15	15	12	12	16	13	16	14	12	13	13.7	11.4
Mollisoni	Punjab .. ..	..	6	8	8	7	8	8	8	10	8	9	8	7	7.9	12.6
Cambodia Co. 2	Madras	29	25	37	33	26	23	29	27	24	26	30	30	33	29.0	12.7	
Umri Bani	Hyderabad	22	24	24	24	22	27	23	27	28	29	30	34	30	26.8	13.2	
P. A. 4F	Punjab	22	22	24	22	16	20	22	20	25	24	27	26	27	22.8	13.7	
Karunganni C7	Madras	26	26	24	24	20	23	26	21	23	25	23	23	34	24.8	14.1	
Gadag 1	Bombay	20	30	33	33	26	32	35	29	30	30	33	30	30	30.8	15.5	
Sind, N. R.	Sind .. ..	..	..	..	..	..	6	6	6	6	8	9	7	7	6.9	16.3
C402	United Provinces .. ..	..	..	..	..	..	..	..	15	14	18	22	10	23	18.0	20.8

In the table showing the seasonal variation in fibre-weight per inch the grand mean and the co-efficient of seasonal variation are calculated for samples received after 1928-29. Owing to a change in the method of the determination of the mean fibre-weight per inch introduced in 1929-30 to which a reference has been made above, the values for the subsequent seasons are not strictly comparable with those for the earlier seasons.

It will be seen that there is very little correspondence between the degree of variability of the standard Indian cottons with respect to all the three above-mentioned properties. Cottons which are "slightly variable" in regard to one property are "variable" or even "very variable" with respect to the other two, the only exceptions being P.A. 4F, Sind N.R. and P.A. 289F which are "very variable" with respect to all the three properties. However, if we consider only two fibre-properties at a time, we can pick out many cottons which fall in the same class as regards variability. Among such pairs it is interesting to note that correspondence between variation in mean fibre-length and the highest standard warp count is more frequent than that between the other two pairs. This brings out indirectly the closer association of spinning performance and mean length in the case of the Indian cottons. It will also be seen that although occasionally there may be large fluctuations in the highest standard warp counts for which these cottons are adjudged suitable, there is no evidence of a steady deterioration of quality in any of them during the last ten seasons. It is necessary to emphasise this point as misleading statements based upon insufficient and unreliable data are sometimes made by ill-informed people to the effect that the Indian cotton crop is deteriorating in quality from year to year.

VI. STANDARD COTTONS OF 1936-37.

The results of the various fibre and yarn tests made on these cottons together with details of machinery and treatment, etc., will be found in the Technological reports in the following pages. A few general remarks may be made here on the performance of the 1936-37 cottons as compared with those of the last few seasons. It was stated in a former issue of this Bulletin that the standard cottons of 1930-31 gave, on the whole, much better performance than those of 1929-30 but that this improvement was not maintained in the following season. The set-back, however, proved temporary, as the 1932-33 cottons gave on the whole better performance than those of 1931-32. This improvement was maintained in the following two seasons and in 1934-35 the cottons generally gave even better results than in 1933-34. Thus, since 1930-31 the spinning performance of these cottons showed a steady improvement with a few exceptions. This improvement, however, suffered a set-back in the 1935-36 season, from which there is a welcome change for the better to some extent, in the current season. In order to concentrate our attention on the current and the last season, the following table has been prepared in which these cottons have been divided into three classes, viz., those which gave better performance (column 1), those which gave the same performance (column 2), and those which gave a poorer performance (column 3) as compared with the last year's samples. The highest standard warp counts for which these cottons are adjudged suitable have been adopted as an index of spinning performance in each case:—

1	2	3
Better.	Same.	Poorer.
Wagad 8 P.A. 4F. C. 402. Verum 262 (Nagpur) " (Akola). Cambodia Co. 2 Nandyal 14. Karunganni C7.	Gadag 1. Sind N.R. A. 19. Hagari 1.	Jayawant. Surat 1027 A.L.F. Sind Sudhar. P.A. 289 F. Mollisoni. V434 (Akola). Late Verum (Nagpur). Umri Bani.

It will be seen that 8 cottons show an improvement over last year, 4 gave practically the same test, while 8 cottons registered poorer results. The improvement is most pronounced in the case of C.402 and Karunganni C7, less so for Verum 262 (Akola) and quite small in the case of the other cottons. The decline is most marked in the case of Surat 1027 A.L.F., less so for V. 434 (Akola) and Umri Bani, while it is quite small for the other cottons. Among the Madras cottons all except Hagari registered an improvement over last year, Hagari 1 giving practically the same result. Among the Bombay Cottons only Wagad showed a slight improvement, Gadag 1 remained unchanged, while Jayawant and Surat 1027 A.L.F. both suffered a decline, which, as stated above, is quite appreciable in the case of the latter cotton. Thus, while Madras cottons gave better results than last year, Bombay cottons gave, on the whole, poorer results. The C.P. cottons were equally divided, the two Verums 262 from Nagpur and Akola giving better results than last year, while the two new selections, V. 434 (Akola) and Late Verum (Nagpur) gave poorer test. The Hyderabad cotton, Umri Bani also gave poorer results as compared with last year. Among the Sind cottons, Sind N.R. remained unchanged, but the improvement noticed last year in Sind Sudhar dwindled down this year and this cotton had to yield again the first place among the standard Indian cottons to P.A. 289F, in spite of a slight decline, as compared with last year, in the spinning performance of the latter cotton. The other Punjab-American cotton, P.A. 4F showed, on the other hand, a slight improvement, while the Punjab *desi* cotton, Mollisoni, failed to come upto last year's level. Among the U.P. cottons C. 402 showed a very considerable improvement over last year, while A. 19 registered practically the same performance.

1.—JAYAWANT (Kumpta).

Seasons.

1926-27 (Sample No. 240).	1932-33 (Sample No. 2015).
1927-28 (Sample No. 394).	1933-34 (Sample No. 2416).
1928-29 (Sample No. 593).	1934-35 (Sample No. 2762).
1929-30 (Sample No. 840).	1935-36 (Sample No. 3176).
1930-31 (Sample No. 1033).	1936-37 (Sample No. 3678).
1931-32 (Sample No. 1377).	

I.—AGRICULTURAL DETAILS.

- (i) *Botanical Species* :—*Gossypium herbaceum*.
- (ii) *History* :—A pure strain obtained from a cross between two pure line selections of Kumpta, viz., Dharwar 1 and Dharwar 2. It possesses the good characters of both parents, namely, staple and resistance to wilt.
- (iii) *District of Growth* :—The districts of Dharwar, Belgaum, Bijapur, and the several Indian States. The particular samples used in these tests were grown at the Government Farm, Dharwar.
- (iv) *Growing Period* :—Sown from the first week of August to the end of September, and usually picked from the 2nd week of February upto the middle of April.
- (v) *Soil* :—Deep and medium black soil.
- (vi) *Rainfall* :—From 20 to 30 inches annually; in 1932-33 about 40 inches; in 1933-34, the rainfall of the dry tract was upto 28" and that of the transition tract was 40"; 28" in 1934-35; 30.94" in 1935-36; 24" in 1936-37.
- (vii) *Temperature* :—Average minimum about 60° F.
- (viii) *Plant Particulars* :—(Average Values):—
- Bolls per plant : 12 (spacing : 24" × 12").
 - Seeds for boll : 18.
 - Weight of seed : 56 milligrammes.
 - Weight of lint per seed : 21 milligrammes.
 - Ginning Percentage : Normally 28-29 (transition tract), 26-27 (dry tract); in 1933-34, 1 per cent. more than the normal in both tracts. 28.2 in 1934-35; 28.30 in 1935-36; 28 in 1936-37.
- (ix) *Yield of seed-cotton* :—Normally about 300 lbs. per acre. In 1932-33 the season was unfavourable owing to heavy rains in the early stage and anti-monsoon rains in the picking season which resulted in a yield of about 175 lbs. per acre; in 1933-34 due to abnormal monsoon conditions in the growing period and anti-monsoon showers in the picking time, the yield was only 100 lbs. per acre. 500-700 lbs. in the Government Farm, Dharwar and 300 lbs. on an average in the district in 1934-35; 744 lbs. per acre in 1935-36; 653 lbs. in 1936-37.
- (x) *Area under cultivation* :—
- | | | | |
|-----------|--------------|------------|-----------------|
| 1929-30.. | 1,000 acres. | 1933-34 .. | 1,38,140 acres. |
| 1930-31.. | 18,000 " | 1934-35 .. | 1,86,350 " |
| 1931-32.. | 1,16,500 " | 1935-36 .. | 1,65,200 " |
| 1932-33.. | 61,020 " | 1936-37 .. | 1,72,300 " |

The above figures relate only to the area under seed of known origin.

II.—GRADER'S REPORT.

—	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under.	Kumpta.	Broach.	Kumpta.	Broach.	Broach.	J/A Broach.	Broach.	Broach.	Broach.	Broach	Broach
Class	Superfine.	Superfine.	Superfine.	Fine.	Extra Superfine.	Superfine.	Superfine.	Fine.	Superfine.	Superfine.	Superfine.
Colour	Creamy.	White.	Slight cream.	White.	White.	White to cream.	Slightly cream.	Cream.	White.	White.	Brownish white.
Staple Length ..	7/8 inch.	7/8 inch.	1 1/8 inch.	1 inch.	Full 1 1/4".	1 1/8 inch.	1 inch.	31/32 inch.	15/16 inch.	7/8 inch.	15/16 inch
Staple Strength ..	Good.	Fair.	Good.	Good.	Good.	Good.	Fair.	Good.	Good.	Good.	Very good.
Regularity	Fair.	Irregular.	Fair.	Good.	Fair.	Fair.	Fair.	Regular.	Regular.	Regular.	Regular.
Value above or below contract rate ..	Rs. 10 on.	Rs. 30 on.	Rs. 60 on.	Rs. 35/40 on.	Rs. 75 on.	Rs. 60 on.	Rs. 55 on.	Rs. 70 on.	Rs. 80 on.	Rs. 40 on.	Rs. 50 on.
Basis .. ..	..	Rs. 398.	Rs. 340.	Rs. 205.	Rs. 200.	Rs. 166-8-0	Rs. 177.	Rs. 225.	Rs. 232.	Rs. 199.	Rs. 215.
Date of Valuation ..	20-4-27.	21-8-28.	28-9-29.	16-9-30.	1-7-31.	2-7-32.	5-12-33.	14-8-34.	3-7-35.	23-5-36.	8-7-37.
Remarks .. ..	..	..	Soft.	..	..	..	..	..	..	Somewhat waxy.	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.										
	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
9	1.3	0.4	..	..	..	..	..	0.5	0.3	0.4	0.1
10	1.3	1.3	0.7	1.2	1.4	1.3	2.0	1.6	1.4	1.3	1.4
11	2.6	2.4	2.5	1.9	2.8	1.5	2.9	3.1	2.6	2.6	2.4
12	6.6	6.0	4.7	6.8	6.0	5.0	7.3	6.6	5.5	5.8	5.4
13	17.8	17.1	10.4	14.8	11.1	11.1	16.3	14.1	11.0	10.8	12.9
14	33.2	31.4	19.0	30.6	22.4	23.5	26.0	25.3	23.1	21.0	26.0
15	27.0	29.1	28.5	28.4	30.2	36.0	24.8	27.7	30.9	28.0	28.7
16	10.2	9.8	22.9	13.0	19.5	18.6	14.9	15.5	18.1	19.1	17.4
17	1.8	2.5	9.4	3.3	5.6	5.0	5.8	4.8	5.4	7.5	5.1
18	..	..	1.3	..	1.0	..	..	0.8	1.1	2.6	0.6
2. Fibre-Length (inch):—											
(a) By Balls Sorter	0.89	0.89	0.97	0.91	0.94	0.94	0.91	0.91	0.94	0.95	0.93
(b) By Baer Sorter	0.87	0.87	0.95	0.94	0.97	0.92	0.92	0.90	0.94	0.93	0.92
3. Fibre-Length Irregularity (%):—											
(a) By Balls Sorter .. .. .	..	..	..	11.4	16.3	13.9	14.2	16.1	15.9	15.8	13.9
(b) By Baer Sorter .. .. .	..	..	..	..	..	..	..	..	..	..	..
4. Fibre-Weight per inch (milli-ounce):—											
(a) By Balls Sorter .. .. .	..	0.193	0.207	0.181	0.175	0.183	0.194	0.147	0.140	0.150	0.189
(b) By Baer Sorter .. .. .	..	..	..	..	..	..	..	..	..	..	..
5. Fibre-Strength (oz.):—											
(a) By Balls Tester .. .. .	..	..	..	..	..	..	..	0.141	0.146	0.153	0.166
(b) By O'Neil Tester .. .. .	..	..	..	..	..	..	..	0.147	0.149	0.151	0.168
6. Fibre-Strength per unit fibre-weight per inch:											
(a) By Balls Tester .. .. .	..	..	..	..	..	..	..	0.98	1.05	1.01	0.88
(b) By O'Neil Tester .. .. .	..	..	..	..	..	..	..	..	..	..	..
7. Maturity Test Results (%):—											
(a) Mature .. .. .	..	..	..	..	..	..	..	..	57	55	84
(b) Half-mature .. .. .	..	..	..	..	..	..	..	..	16	24	11
(c) Immature .. .. .	..	..	..	..	..	..	..	..	27	21	5

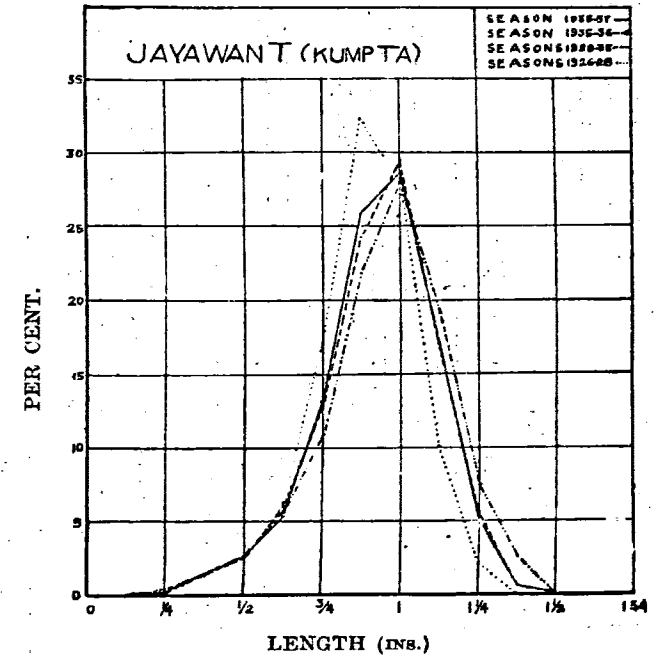


Fig. 1.—Sorter Diagrams for Jayawant (Kumpta).

IV.—SPINNING TESTS.

1. Treatment :—

(a) *Blow-room*—Upto 1930-31 (inclusive) :—Lattice feeder, Crighton (once), Hopper, Scutcher (3 times).

Upto 1933-34 (inclusive) :—As above but two passages in the Crighton.
1934-35 onwards :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room* Upto 1934-35 :—Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Light cream.	Creamy.	White to creamy-white; bright.	Creamy-white; bright.	White; bright.	White; very bright.	White to creamy-white; very bright.	White to creamy-white; bright.	White; bright.	White; bright.	Creamy white to white; bright.
Cleanliness	Very clean (free of leaf)	Clean	Very clean	Perfectly clean.	Perfectly clean.	Clean	Clean	Very clean.	Clean	Clean	Very clean.
Feel	Nice bodied	..	Good soft	Good bodied	Good soft	Good	Good bodied.	Good	Smooth bodied.	Smooth and bodied.	Good bodied.
Ginning and neppiness.	Well ginned.	..	Well ginned.	Well ginned.	Well ginned.	Well ginned.	Well (saw) ginned.	Well ginned.	Well ginned.	Well ginned.	Well ginned.
Seeds	Cut seeds present.	Free of seed.	..	..	..	..	..	..	..	..	..
Card-silver	..	..	..	Very clear	Clean Good	Clean Good	Clean Even	Clean and Even	Clean and Even	Clean and Even	Good & clean.
Card-web	..	..	..	..	..	..	..	..	..	..	..
Weight of ten flat-strips.	..	..	..	9.3 grams	8.7 grams	12.4 grams	10.0 grams	15.0 grams	17.1 grams	9.8 grams	11.1 grams.
Remarks	..	..	Staple is fine, regular and strong.	Staple is fine, fairly regular and strong.	..	Altogether a very desirable sample.	..	..	A very desirable cotton.	..	..

3. Spinning Test Details and Results :—See Table 1, page 16.

V.—REMARKS.

(i) *Fibre*.—The mean fibre-length shows a fair amount of seasonal variation, being unusually low in the two seasons, 1926-28, and exceptionally high in 1928-29 and again in the two seasons, 1934-36. The fibre-length irregularity is high in 1930-31, and in the three seasons, 1933-36. The fibre-weight per inch is fairly constant between 1929-30 and 1932-33, unusually low in 1934-35, and again high in 1936-37. Both the fibre-strength and the fibre-strength per unit fibre-weight per inch remained fairly uniform in the first three seasons in which they were tested, but in spite of an increase in the former, the latter is unusually low in 1936-37. The 1936-37 sample is slightly shorter but more regular in length than its predecessor and has a much higher percentage of mature fibres, but it is definitely coarser which has reduced its intrinsic strength.

(ii) *Waste*.—The samples of this cotton have always been supplied in a very clean condition and have given a low blow-room loss. The card-room loss has also been generally low, though the 1934-35 sample gave a higher card loss than the others.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few in 20's and 30's counts, but fairly numerous in 40's counts. Since 1933-34 they have been few even in 40's counts.

(iv) *Yarns*.—This cotton usually gives even 20's and even to fairly even 30's, though the 30's yarns of 1934-35 are better than usual. Its yarns were only slightly neppy upto 1932-33, after that year they became rather neppy, but show a good improvement in this respect in the current season. In spite of the seasonal variation in its mean fibre-length, its spinning performance has remained remarkably uniform, the best results being obtained in the two seasons, 1934-36.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1926-27	..	38's.	1932-33	..	36's.
1927-28	..	38's.	1933-34	..	38's.
1928-29	..	38's.	1934-35	..	42's.
1929-30	..	40's.	1935-36	..	42's.
1930-31	..	37's.	1936-37	..	41's.
1931-32	..	40's.			

2.—GADAG 1 (Dharwar-American).

Seasons. { 1923-24 (Sample No. 70).
1924-25 (Sample No. 71).
1925-26 (Sample No. 131).
1926-27 (Sample No. 244).
1927-28 (Sample No. 368).
1928-29 (Sample No. 513).
1929-30 (Sample No. 719).

Seasons. { 1930-31 (Sample No. 1015).
1931-32 (Sample No. 1305).
1932-33 (Sample No. 1746).
1933-34 (Sample No. 2264).
1934-35 (Sample No. 2707).
1935-36 (Sample No. 3155).
1936-37 (Sample No. 3619).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A pure line selection from the hairy-leaved type of Dharwar-American (Dharwar-Upland). Upland Georgian and New Orleans types were originally introduced at the Dharwar Farm, but unsuccessfully, in 1830; fresh seed was imported at intervals; in 1912 the work on American cotton was transferred to Gadag, where Gadag 1 was eventually isolated from the Dharwar-American mixture.
- (iii) *District of growth* :—Dharwar district. The cotton used in these tests is from the fourth generation crop grown at Hulakoti near Gadag, from seed, which has been multiplied on the Gadag-Selfing Plot, Gadag for the first two generations and on the cultivators' fields at Kurtakoti in the third generation.
- (iv) *Growing period* :—Sown from the first week in September to the middle of October, and picked from the first week of March upto the middle of April. In 1932-33, the picking extended to the first week of May.
- (v) *Soil* :—Medium black.
- (vi) *Rainfall* :—From 20 to 30 inches annually. In 1932-33 it was abnormal and was fairly continuous during the season and interfered with all operations from preparing the land to the end of picking. Much cotton was damaged on this account and many bolls remained unopened on the plants. In 1933-34, above normal. 13.5 inches in 1934-35; 21.79 inches in 1935-36; 27.63 inches in 1936-37.
- (vii) *Temperature* :—Average minimum about 60° F.
- (viii) *Plant Particulars* (Average values) :—
- (a) Bolls per plant : 5 (spacing : 20" × 12").
- (b) Seeds per boll : 17.
- (c) Weight of seed : 97 milligrammes.
- (d) Weight of lint per seed : 44 milligrammes.
- (e) Ginning percentage : 34.
- (ix) *Yield of seed-cotton* :—In 1932-33 the yield in this part is 140 lbs. per acre though the average for the whole tract is only 75 lbs. as the latter part of the season was very unfavourable. The rainfall interfered with opening of bolls and also spoiled the cotton which was opened. In 1933-34, 170 lbs. per acre. The yield was reduced to some extent owing to rains in April 1934, the quality of the crop in respect of class was also spoiled to a small extent. In 1934-35, only 65 lbs. per acre. The yield was reduced owing to lack of moisture in the soil. In 1935-36, 160 to 168 lbs. per acre; in 1936-37 the estimation is about 170 lbs. of seed cotton per acre.

(x) *Area under cultivation* :—

1923-24 ..	65,000 acres.	1930-31 ..	78,600 acres.
1924-25 ..	119,000 "	1931-32 ..	121,300 "
1925-26 ..	100,000 "	1932-33 ..	54,100 "
1926-27 ..	72,000 "	1933-34 ..	69,420 " (Sown with pedigree).
1927-28 ..	58,300 "	1934-35 ..	90,250 " (" " ").
1928-29 ..	76,900 "	1935-36 ..	92,100 " (" " ").
1929-30 ..	72,300 "	1936-37 ..	55,300 " (" " ").

The above figures give the annual area under seed of known origin.

II.—GRADER'S REPORT.

	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under ..	Kumpta.	F. G. Broach.	Broach.	Kumpta.	Kumpta.	Broach. Kumpta.	Broach.	Broach.	Broach.	Broach A/M.	Broach A/M.
Class ..	Fine.	Superfine.	Fine.	Fine.	Fine.	Fine.	Fine.	Fine.	Superfine.	Fine.	Superfine.
Colour ..	Creamy.	White.	White.	White.	White.	White.	White.	White.	White.	Dull white.	White.
Staple Length ..	5/8-7/8 in.	6/8-7/8 in.	7/8 in.	1 in.	3/4-15/16 in.	29/32 in.	7/8 in.	13/16 in.	13/16 in.	Barely 3/4 in.	3/4 in.
Staple Strength ..	Fair.	Fair.	Good.	Fair.	Poor.	Fair.	Fair.	Fair.	Fair.	Fair.	Moderate.
Regularity ..	Poor.	Regular.	Good.	Fair.	Poor.	Fair.	Poor.	Fair.	Regular.	Bather irregular & wasty.	Slightly irregular & wasty.
Value above or below contract rate ..	Rs. 15 off.	Rs. 35 to 40 on.	Rs. 50 on.	Par.	Rs. 10 off.	Rs. 40 on.	Rs. 5 on.	Rs. 30 on.	Rs. 50 on.	Rs. 10 on.	Rs. 5 on.
Basis ..	Rs. 315.	..	Rs. 326.	Rs. 300.	Rs. 250.	Rs. 181.	Rs. 190.	Rs. 200.	Broach.	Rs. 203.	Rs. 232.
Date of Valuation ..	20-4-27.	2-4-28.	14-5-29.	24-5-30.	15-4-31.	23-4-32.	1-5-33.	23-5-34.	..	25-4-36.	22-5-37.
Remarks ..	..	..	..	Mostly Upland cotton.	Not typical.	Soft. More like Upland.	Clean.	..	..	..	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.													
	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.3	0.1	1.2	..	0.4	0.2	0.1	..	0.5	1.0	1.2	0.8	0.3	1.5
3	1.9	2.3	2.4	2.7	1.7	1.8	1.6	3.0	2.6	2.6	3.4	2.2	1.7	2.6
4	3.5	4.6	4.8	4.8	3.7	3.8	3.8	4.8	5.0	5.7	5.2	4.9	4.2	5.0
5	7.0	12.1	9.7	11.0	7.2	9.4	8.1	8.1	13.6	13.0	10.5	12.2	10.0	10.1
6	14.5	25.7	21.2	29.8	17.0	24.4	19.1	18.9	29.5	27.0	23.8	31.4	29.2	22.8
7	29.9	35.3	34.1	37.2	37.7	37.6	38.8	31.1	32.3	32.3	32.7	35.8	35.8	35.5
8	29.8	15.7	21.6	11.8	25.7	18.4	23.3	23.6	12.2	14.8	17.3	10.5	13.7	18.5
9	11.0	4.1	5.0	2.7	6.0	4.3	5.1	8.7	3.7	3.6	5.9	2.1	4.7	3.4
10	1.9	0.1	..	..	0.6	0.1	0.1	1.8	..	..	..	0.1	1.4	0.6
11	0.2	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Fibre-Length (inch):—														
(a) By Balls Sorter	0.89	0.81	0.82	0.80	0.86	0.83	0.85	0.86	0.79	0.80	0.81	0.79	0.84	0.81
(b) By Bacr Sorter	0.89	0.81	0.83	0.82	0.86	0.82	0.84	0.89	0.80	0.82	0.81	0.79	0.83	0.79
3. Fibre-Length Irregularity (%)	..	..	..	..	..	..	13.0	15.6	15.5	17.5	18.1	14.5	13.9	17.8
4. Fibre-Weight per inch (millionth of an oz.)	0.174	0.154	0.150	0.170	0.167	0.162	0.148	0.153	0.154	0.134	0.153	0.147	0.162	0.166
5. Fibre-Strength (oz.):—														
(a) By Balls Tester	0.135	0.135	0.109	0.145	0.142	0.135	0.134	0.132	0.147	0.150	0.116	0.135	0.150	0.128
(b) By O'Neill Tester	0.142	0.116	0.106	0.137	0.155	0.147	0.147	0.144	0.137	0.153	0.132	0.145	0.152	0.137
6. Fibre-Strength per unit fibre-weight per inch	0.80	0.82	0.71	0.79	0.89	0.87	0.95	0.80	0.92	1.13	0.81	0.95	0.93	0.80
7. Fibre-Rigidity (millionth of an oz. square in.)	0.203	0.137	0.149	0.151	0.152	0.133	0.157	0.152	0.202	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch)	0.70	0.67	0.71	0.63	0.62	0.59	0.64	0.60	0.60	0.63	..	..	..	..
9. Convolutions per inch	130	132	134	110	115	122	140	120	118	125	..	..	..	..
10. Maturity Test Results (%)														
(a) Mature	..	..	..	..	..	..	..	..	..	..	..	61	63	83
(b) Half-mature	..	..	..	..	..	..	..	..	..	..	..	27	26	14
(c) Immature	..	..	..	..	..	..	..	..	..	..	..	12	11	3

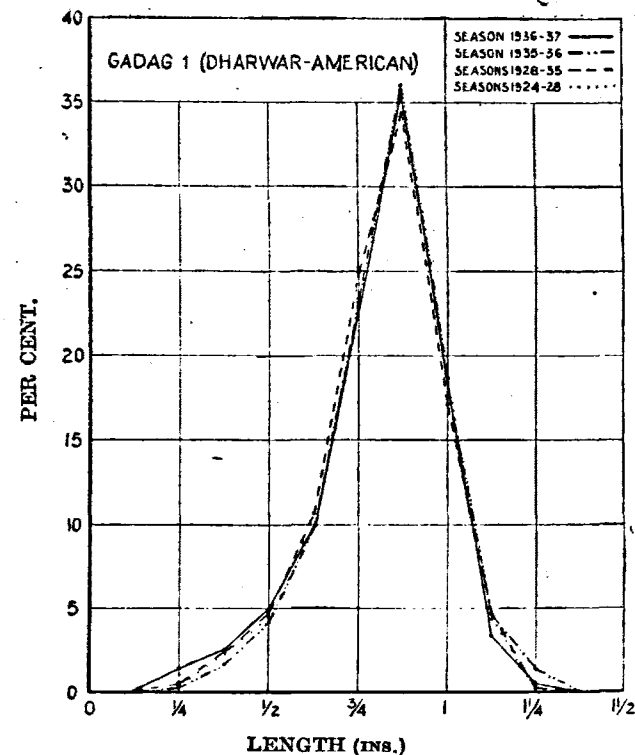


Fig. 2.—Sorter Diagrams for Gadag 1 (Dharwar—American).

IV—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1934-35 (inclusive):—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1926-27 cotton was passed direct through the Crighton (once only).

1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room* :—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover, and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy.	Creamy-white.	Creamy-white.	Creamy-white; bright.	White; bright.	Dull creamy-white.	Creamy-white.	White to creamy-white; bright. Clean.	White to creamy-white; brightish. Clean.	White to creamy-white; brightish. Fairly clean.	White to creamy-white.
Cleanliness ..	Very clean.	Fairly clean.	Fairly clean.	Leafy.	A trifle leafy.	Clean; almost free of leaf and stains. Soft.	Fairly clean.	Clean.	Clean.	Fairly clean.	A little leafy.
Feel	Nice bodied.	Nice, soft and bodied.	Good.	Good bodied.	Good.	Soft.	Good soft.	Good smooth.	Good smooth.	Good.	Good.
Ginning and neppiness ..	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds	0.6 per cent. ginned and unginned.	..	Fair number of small undeveloped seeds.	One per cent. ginned and unginned and occasional cut seed.	..	..	..	..	..	..	..
Card-silver ..	..	..	..	..	Clean ..	..	Clean.	Clean.	Clean and soft. Good.	Clean.	Clean and good.
Card-web ..	..	..	..	..	First class.	Very even and free of nep.	Good.	Even.	Good.	Even and nep-free.	Good, nep-free.
Weight of ten flat strips ..	..	..	..	..	12.5 grams.	15.2 grams.	17.1 grams.	14.6 grams.	16.4 grams.	12.2 grams.	11.8 grams.
Remarks ..	..	..	..	..	..	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 2, page 20.

Card Production for Sample 70 :—11.4 lb. per hour.

Ring Frame Production for 40's, Sample 70 :—2.43 oz. per spindle per 10 hours.

V.—REMARKS.

(i) *Fibre* :—The fibre-properties of this cotton show large seasonal variations. The mean fibre-length is some 9 per cent. higher in 1923-24 and again in 1930-31 than in the following three seasons. The staple length irregularity increased steadily upto 1933-34, declined in the next two seasons and rose again in the current season. The fibre-weight per inch was unusually low in the two seasons 1924-26 and lowest of all in 1932-33. With the exception of 1933-34 and 1936-37 the fibre-strength has remained fairly constant since 1926-27, but the fibre-strength per unit fibre-weight per inch is variable, the highest value being recorded in 1932-33 and the lowest, since 1926-27, in the following season. The 1936-37 cotton is somewhat shorter and more irregular in length than its predecessor, but it has a much higher percentage of mature fibres.

(ii) *Waste* :—The samples of this cotton usually give about 7 per cent. blow-room and 8 per cent. card-room loss, but the former loss was rather high in 1929-30 and the latter in 1932-33.

(iii) *Breakages* :—Yarn breakages in the ring frame are generally few in 20's but are fairly numerous in 30's and 34's, the exceptions being 20's of 1928-29 and 1931-32, all counts of 1932-33 and 34's of 1933-34. The 1936-37 sample gave fairly numerous breakages in the ring frame.

(iv) *Yarns* :—Yarns spun from this cotton have given variable results in the different seasons as regards evenness, neppiness and strength. Thus, the 20's B yarns which are generally even, are very even to even in 1930-31 and only even to fairly even in the following season. They are generally somewhat neppy but those of 1936-37 are practically free of neps. As will be seen from the following table this cotton gave the best yarn strength results in 1926-27 and 1927-28, not so good in 1923-24 and very poor indeed in 1924-25. Since 1931-32, its performance has been less variable than in the earlier seasons.

1923-24	..	36's.	1928-29	..	26's.	1933-34	..	30's.
1924-25	..	20's.	1929-30	..	32's.	1934-35	..	33's.
1925-26	..	30's.	1930-31	..	35's.	1935-36	..	30's.
1926-27	..	38's.	1931-32	..	29's.	1936-37	..	30's.
1927-28	..	38's.	1932-33	..	30's.			

TABLE 2.—SPINNING TEST RESULTS FOR GADAG I (DHARWAR-AMERICAN).

HANK (1936-37).				TRAVELLER COUNTS.													SPINDLE SPEED (1936-37).														
Card ..	..	..	0.17														20'sA ..	..	9,450 r.p.m.												
Slubber ..	..	..	0.75														20'sB ..	..	10,250 r.p.m.												
Inter ..	..	..	1.76														30's ..	..	9,450 r.p.m.												
Rover ..	..	..	4.66														34's ..	..	9,550 r.p.m.												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS*				YARN TEST RESULTS.															TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)			
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakage per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts.	Strength (cos.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)	Evenness Class.					Neps per yard.	Turns per inch Actual.
513	1923-23	13-5-29	20A	6.8	7.9	0.6	14.7	12	186	4.56	16.85	19.6	83.0	5.7	1,627	..	..	..	..	20.1	11.3	10.1	2.4	5.9	10.2	2	3.1	16.2	88	70	66
719	1929-30	25-4-30	..	8.7	8.6	0.6	17.1	44	191	4.80	16.85	20.2	71.0	5.6	1,434	20.1	116.9	4.0	2,350	20.9	10.3	12.0	3.7	6.3	7.5	3	2.1	16.2	91	63	69
1305	1931-32	25-4-30	..	10.2	8.6	0.3	18.3	10	198	4.76	16.85	19.8	86.2	4.5	1,707	20.2	124.7	2.7	2,519	20.2	12.1	11.6	3.5	7.7	8.0	3	3.0	16.2	90	65	64
1746	1931-32	19-4-32	..	5.6	8.6	0.6	14.4	70	195	4.48	16.85	19.5	80.1	4.4	1,562	20.0	127.2	3.4	2,544	19.8	10.8	10.6	2.4	7.2	8.2	4	1.9	16.2	85	70	69
2264	1932-33	26-5-34	..	7.6	9.6	0.4	16.6	39	196	4.53	16.85	19.6	83.2	4.6	1,631	19.6	139.4	3.2	2,732	20.0	11.6	9.4	1.2	7.3	5.6	3	2.4	16.2	88	68	70
2264	1933-34	7-5-34	..	5.6	8.6	0.4	14.2	13	195	4.53	16.85	20.0	77.1	6.3	1,542	20.0	117.9	3.8	2,358	20.2	11.4	10.2	2.5	5.2	10.4	3	0.6	16.1	89	68	68
2707	1934-35	29-5-35	..	4.6	8.6	0.5	13.4	5	196	4.63	16.85	20.0	90.8	4.5	1,816	20.0	152.6	4.4	3,052	20.5	12.2	11.8	2.8	7.0	10.2	3	1.8	16.0	81	69	66
3155	1935-36	9-5-36	..	6.6	7.2	0.4	13.7	8	183	4.54	16.85	19.6	83.0	5.6	1,627	19.6	138.0	4.0	2,705	19.8	12.0	12.6	5.0	6.8	9.4	3	0.6	16.2	89	67	70
3619/1	1936-37	27-5-37	..	7.8	7.5	0.3	15.1	16	208	4.35	16.85	19.4	83.2	6.0	1,713	19.5	141.0	4.3	2,750	20.0	12.3	10.9	4.0	7.2	8.5	3	1.0	16.2	89	68	78
3619/2	1936-37	25-5-37	..	7.7	7.5	0.6	15.2	83	207	4.26	16.85	19.6	82.6	4.9	1,619	19.7	137.4	3.4	2,707	20.2	11.3	13.0	3.0	7.1	7.0	4	0.6	16.1	90	68	79
719	1929-30	25-4-30	20B	..	7.9	0.6	15.3	12	195	4.88	17.98	20.0	95.6	3.9	1,812	20.2	132.5	3.0	2,650	20.7	12.7	8.6	1.2	7.7	8.4	3	2.7	17.2	91	64	61
1015	1930-31	2-4-31	..	7.5	..	..	..	16	197	4.65	17.98	20.0	90.6	4.2	1,800	20.4	134.0	4.3	2,734	20.0	13.6	10.0	1.2	7.6	7.7	2	2.4	17.3	86	70	69
1305	1931-32	20-4-32	..	..	..	..	..	28	194	4.58	17.98	20.3	82.4	4.2	1,664	20.2	130.2	3.8	2,699	20.6	10.6	10.1	0.5	7.0	7.4	4	2.2	17.4	82	72	68
1746	1932-33	27-4-33	..	..	..	..	..	52	196	4.58	17.98	19.8	89.0	4.0	1,742	20.0	142.0	3.7	2,840	20.4	12.0	10.1	1.2	8.0	6.4	3	2.4	17.2	88	65	69
2264	1933-34	7-5-34	..	..	..	..	..	16	198	4.53	17.98	20.1	84.8	3.6	1,704	20.2	123.3	2.8	2,491	20.2	12.2	9.6	1.0	5.6	11.5	3	1.1	17.2	89	68	64
2707	1934-35	29-5-35	..	..	..	..	..	2	200	4.63	17.98	20.0	95.4	4.4	1,908	20.2	154.0	3.4	3,111	20.8	12.9	10.2	2.0	7.2	9.0	3	2.1	17.1	82	68	67
3155	1935-36	9-5-36	..	..	..	..	..	13	192	4.64	17.98	20.0	87.3	5.3	1,746	20.0	137.7	4.4	2,754	20.0	12.4	11.8	4.5	7.1	8.4	4	1.2	17.2	90	68	70
3619/1	1936-37	27-5-37	..	..	..	..	..	21	210	4.35	17.98	19.7	92.6	4.3	1,824	19.5	151.4	4.0	3,952	21.0	12.1	9.9	2.0	7.2	8.3	3	0.8	17.2	89	69	79
3619/2	1936-37	26-5-37	..	..	..	..	..	62	210	4.26	17.98	19.1	97.0	4.2	1,853	18.7	160.8	3.6	3,007	19.1	13.1	9.4	4.0	7.3	8.1	3	0.8	17.0	90	68	79
513	1923-29	14-5-29	26	..	..	..	..	35	172	5.48	20.23	25.5	56.1	6.8	1,430	25.1	96.2	3.9	2,415	25.9	8.4	11.8	3.0	6.0	8.5	4	1.8	19.3	90	64	71
719	1929-30	26-4-30	..	..	..	..	..	20	177	6.34	20.23	26.0	63.2	5.1	1,643	26.6	96.3	2.2	2,562	26.2	9.8	10.0	3.0	7.2	8.0	4	2.7	19.4	90	64	64
513	1923-23	14-5-29	30	..	..	..	..	10	147	6.73	21.86	29.4	51.5	5.9	1,514	..	..	..	..	30.2	7.4	10.5	2.6	5.0	11.9	3	2.8	21.2	88	68	68
719	1929-30	26-4-30	..	..	..	..	..	35	157	6.40	21.86	29.4	45.7	6.3	1,343	23.8	75.6	4.1	2,177	30.6	6.6	14.1	6.0	5.7	12.1	5	1.9	20.9	91	61	72
1015	1930-31	2-4-31	..	..	..	..	..	23	162	7.25	21.86	30.0	50.4	6.4	1,512	29.9	84.4	2.2	2,523	31.2	7.9	12.6	5.0	6.7	9.5	6	3.1	20.8	91	61	63
1305	1931-32	20-4-32	..	..	..	..	..	164	6.80	21.86	29.8	55.0	4.9	1,639	29.9	86.5	2.2	2,589	30.3	8.1	11.6	3.2	6.3	12.1	4	2.3	21.1	87	69	68	
1746	1932-33	27-4-33	..	..	..	..	..	41	159	6.07	21.86	29.5	47.4	5.2	1,398	30.0	87.3	2.0	2,589	29.6	7.0	12.6	6.2	6.3	9.9	5	2.1	21.2	87	71	70
2264	1933-34	7-5-34	..	..	..	..	..	50	6.69	21.86	29.3	49.6	5.4	1,453	29.6	83.5	2.8	2,472	29.2	7.2	14.0	7.0	6.8	10.0	5	2.4	21.0	87	63	70	
2707	1934-35	29-5-35	..	..	..	..	..	23	180	6.69	21.86	29.3	49.6	5.4	1,453	29.6	83.5	2.8	2,472	29.2	7.8	13.2	4.8	4.8	12.2	4	1.1	21.0	89	69	69
3155	1935-36	9-5-36	..	..	..	..	..	22	158	6.92	21.86	29.6	55.4	7.8	1,640	29.2	103.6	3.6	3,025	29.6	8.4	13.4	5.0	6.2	13.6	4	2.1	21.0	83	68	70
3619/1	1936-37	27-5-37	..	..	..	..	..	22	156	6.92	21.86	29.6	50.0	7.8	1,490	30.2	88.3	2.5	2,667	30.0	7.6	12.6	5.6	6.0	9.6	4	1.0	21.0	90	69	70
3619/2	1936-37	26-5-37	..	..	..	..	..	26	160	6.67	21.86	29.6	51.4	6.8	1,521	29.4	90.2	2.8	2,652	31.4	7.2	15.4	6.5	6.0	10.9	5	1.0	21.0	89	68	78
				..	..	..	..	46	159	6.61	21.86	29.1	54.4	6.0	1,583	28.4	91.2	2.6	2,590	30.1	7.5	15.0	7.0	6.3	9.6	5	1.0	20.5	90	67	84
1305	1931-32	22-4-32	34	..	..	..	..	49	133	7.65	23.26	33.4	38.2	7.2	1,276	34.2	75.2	3.3	2,572	34.4	5.5	14.4	8.5	5.8	11.6	6	2.1	22.6	87	66	68
1746	1932-33	23-4-33	..	..	..	..	..	72	148	7.34	23.26	33.0	41.4	6.2	1,366	33.2	78.9	2.8	2,619	34.0	6.4	14.3	7.5	6.6	10.6	5	2.2	22.3	87	62	68
2264	1933-34	8-5-34	..	..	..	..	..	48	152	7.58	23.26	33.2	40.5	6.3	1,345	33.4	74.8	3.6	2,498	33.6	6.2	15.2	8.0	4.4	14.3	5	1.0	22.4	89	64	70
2707	1934-35	28-3-35	..	..	..	..	..	39	152	7.54	23.26	33.6	44.5	4.6	1,495	33.6	84.1	3.9	2,828	34.1	6.5	14.8	6.2	5.4	24.0	5	1.6	22.3	84	64	64
3155	1935-36	9-5-36	..	..	..	..	..	42	146	7.80	23.26	34.5	36.2	7.5	1,249	33.2	74.1	3.2	2,608	34.8	5.7	17.2	10.2	5.5	14.4	5	1.1	22.8	90	68	69
3619/1	1936-37	27-5-37	..	..	..	..	..	27	151	7.42	23.26	33.4	41.2	7.0	1,376	33.8	79.6	4.0	2,690	34.7	6.4	14.8	4.5	6.2	8.8	6	1.0	22.4	88	66	81
3619/2	1936-37	27-5-37	..	..	..	..	..	25	149	7.42	23.26	32.8	42.8	6.2	1,404	33.1	80.8	3.4	2,674	34.4	6.4	14.6	6.5	6.1	8.2	6	1.2	22.1	90	66	74
1015	1930-31	7-4-31	40	..	..	..	..	11	120	8.98	26.97	38.9	34.5	6.3	1,342	..	..	..	..	40.0	5.5	11.5	4.0	4.5	14.3	5	2.9	25.8	88	68	67
				..	..	..	..	35	134	9.14	26.97	40.0	35.3	4.4	1,412	40.0	67.2	3.2	2,688	40.0	5.8	13.4	6.0	5.6	18.4	5	2.6	26.4	89	66	67

* Diameter of ring frame front roller—7/8 inch. Diameter of rings—13/16 inch.

3.—SURAT 1027 A.L.F.

Seasons ..	{	1923-24 (Sample No. 104).	Seasons ..	{	1930-31 (Sample No. 1018).
		1924-25 (Sample No. 83).			1931-32 (Sample No. 1313).
		1925-26 (Sample No. 116).			1932-33 (Sample No. 1735).
		1926-27 (Sample No. 246).			1933-34 (Sample No. 2244).
		1927-28 (Sample No. 363).			1934-35 (Sample No. 2761).
		1928-29 (Sample No. 487).			1935-36 (Sample No. 3157).
		1929-30 (Sample No. 716).			1936-37 (Sample No. 3594).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—Derived from a hybrid (1027) originally made at Kirkee Farm in 1901 between *Kumpta* and *Goghari* cottons: two specially good plants (1027A) were isolated in 1904, and continued selection gave in 1907 two new types—1027A, long and coarse, and 1027A, long and fine, the latter being styled 1027 A.L.F. in 1910-11. The selection work was continued thereafter, and the present 1027 A.L.F. is a pure line from an individual selection made in 1917-18. (References: Annual Reports, Surat Agricultural Station, 1907-15; Memoir of the Department of Agriculture in India, Botanical Series, Vol. XII, No. 5, 1924.)
- (iii) *District of growth* :—Broach tract, i.e., Southern Gujarat; Broach and Surat districts and adjacent parts of Baroda State (Navsari district). The particular samples used in these tests have been grown on the Government Farm, Surat.
- (iv) *Growing period* :—Sown in the third week in June, and picked from mid-March onwards.
- (v) *Soil* :—Black cotton soil, supposed to be the result of an alluvium brought down by the Tapti and the Nerbudda rivers.
- (vi) *Rainfall* :—30 to 40 inches annually; 52·4 inches in 1934-35; 41·71 inches in 1935-36.
- (vii) *Temperature* :—Means, 85° F. (April to August); 81° F. (September to November).
- (viii) *Plant particulars (average values)* :—
- Bolls per plant: 35 (spacing: 36" × 36").
 - Seeds per boll: 22 (" : 60" × 24" in 1933-34).
 - Weight of seed: 65 milligrammes.
 - Weight of lint per seed: 34 milligrammes.
 - Ginning percentage: 33·8.
- (ix) *Yield of seed-cotton* :—In 1931-32 the yield was 676 lbs. per acre; in 1932-33, 854 lbs. per acre; in 1933-34, 742 lbs. per acre on Surat Farm; 751 lbs. in 1934-35; 583 lbs. in 1935-36 (in Cotton Breeder's area); 607 lbs. in 1936-37 in Cotton Breeder's area.
- (x) *Area under cultivation* :—
- | | | | | | |
|------------|----------------|------------|----------------|------------|----------------|
| 1923-24 .. | 250,000 acres. | 1928-29 .. | 481,000 acres. | 1933-34 .. | 234,700 acres. |
| 1925-26 .. | 119,000 " | 1929-30 .. | 450,000 " | 1934-35 .. | 356,280 " |
| 1926-27 .. | 465,000 " | 1931-32 .. | 230,700 " | 1935-36 .. | 263,000 " |
| 1927-28 .. | 250,000 " | 1932-33 .. | 238,540 " | 1936-37 .. | 325,000 " |

The above figures relate to the area under seed of known origin; the total area is considerably greater.

II.—GRADER'S REPORT.

	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Actual valued per ..	..	..	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.
.. ..	..	..	Superfine.	Extra Superfine.	Extra Superfine.	Superfine.	Superfine.	Extra Superfine.	Superfine.	Superfine.	Superfine.	Superfine.	Superfine.
.. ..	..	..	White.	White.	White.	White.	White.	White.	White.	White.	Bright; White.	Bright; White.	White.
Length ..	15/16-1 1/8 inch.	Full inch.	15/16 to 1 inch.	1 1/8 inch.	Full 1 inch.	1 inch.	1 1/8 inch.	1 1/8 inch.	Full 1 inch.	15/16 inch.	15/16 inch.	15/16 inch.	Full 1 inch.
Strength ..	Good.	Strong.	Good.	Good.	Good.	Good.	Fair.	Fair.	Good.	Fair.	Good.	Very Good.	Very good.
Uniformity ..	Regular.	Regular.	Fair.	Good.	Good.	Good.	Fair.	Fair.	Fair.	Fair.	Regular.	Regular.	Regular.
Above or below contract rate ..	..	..	Rs. 60 on.	Rs. 105 on.	Rs. 80 on.	Rs. 100 on.	Rs. 75 on.	Rs. 65 on.	Rs. 45 on.	Rs. 70 on.	Rs. 80 on.	Rs. 65 on.	Rs. 90 on.
of Valuation ..	..	..	17-5-27.	23-8-28.	18-3-29.	16-4-30.	15-4-31.	5-5-32.	12-4-33.	30-4-34.	3-7-35.	1-5-36.	15-5-37.
.. ..	..	..	..	..	..	..	..	..	..	..	..	..	Not particularly more silky than average Surat.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.2	0.3	..	0.8	..	0.1	..	0.2	..	..	0.5	0.1	1.0
3	1.1	1.3	1.6	1.0	1.2	1.0	1.8	2.5	1.8	1.5	1.4	1.0	2.5
4	2.1	2.4	2.6	3.1	2.4	1.9	3.0	4.5	3.2	2.7	2.9	2.0	4.0
5	4.7	5.0	4.9	6.1	5.4	4.0	6.0	9.7	6.0	4.7	4.4	3.5	7.0
6	0.1	10.5	9.3	10.2	10.2	0.2	11.3	14.8	11.1	8.4	10.3	7.5	13.0
7	23.1	28.0	17.9	18.2	19.1	20.3	23.5	22.3	19.2	15.7	19.1	16.8	22.0
8	36.1	34.2	28.2	28.0	29.8	32.8	32.2	24.3	30.3	23.2	30.3	28.6	28.6
9	18.8	15.6	24.3	23.3	22.1	22.3	16.2	14.4	20.8	24.9	22.1	25.7	16.0
10	5.4	2.7	9.4	7.7	7.9	7.1	4.7	5.4	6.1	14.5	7.0	12.2	4.5
11	0.4	..	1.8	1.0	1.9	1.8	1.3	1.9	1.5	4.3	2.0	2.6	1.4
12	..	..	..	..	..	..	..	..	..	0.1	..	..	..
2. Fibre-Length (inch) :—													
(a) By Balls Sorter ..	0.95	0.92	0.97	0.95	0.96	0.97	0.93	0.90	0.94	1.00	0.96	1.00	0.91
(b) By Baer Sorter ..	0.95	0.93	0.98	0.94	0.96	0.97	0.95	0.89	0.94	0.98	0.95	1.02	0.93
3. Fibre-Length Irregularity (%) ..													
..	..	..	..	..	..	12.9	16.8	19.7	18.5	17.2	16.5	13.0	21.4
4. Fibre-Weight per Inch (millionth of an ounce)													
..	0.204	0.237	0.200	0.207	0.204	0.180	0.201	0.175	0.190	0.169	0.183	0.168	0.193
5. Fibre-Strength (oz.) :—													
(a) By Balls Tester ..	..	..	0.171	0.159	0.181	0.185	0.183	0.188	0.196	0.174	0.177	0.156	0.176
(b) By O'Neill Tester ..	..	..	0.172	0.175	0.149	0.177	0.190	0.180	0.198	0.193	0.195	0.171	0.169
6. Fibre-Strength per unit Fibre-weight per inch ..													
..	..	..	0.85	0.81	0.81	0.95	0.93	1.05	1.04	1.08	1.02	0.98	0.89
7. Fibre-Rigidity (millionth of an ounce, square inch) ..													
..	..	..	0.162	0.132	0.125	0.157	0.192	0.129	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch) ..													
..	0.72	0.72	0.73	0.74	0.71	0.74	0.67	0.66	0.74	..	..	..	..
9. Convolutions per inch ..													
..	128	127	96	73	63	45	63	61	62	..	..	..	..
10. Maturity Test Results (%) :—													
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	50	45	68
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	21	28	17
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	29	27	15

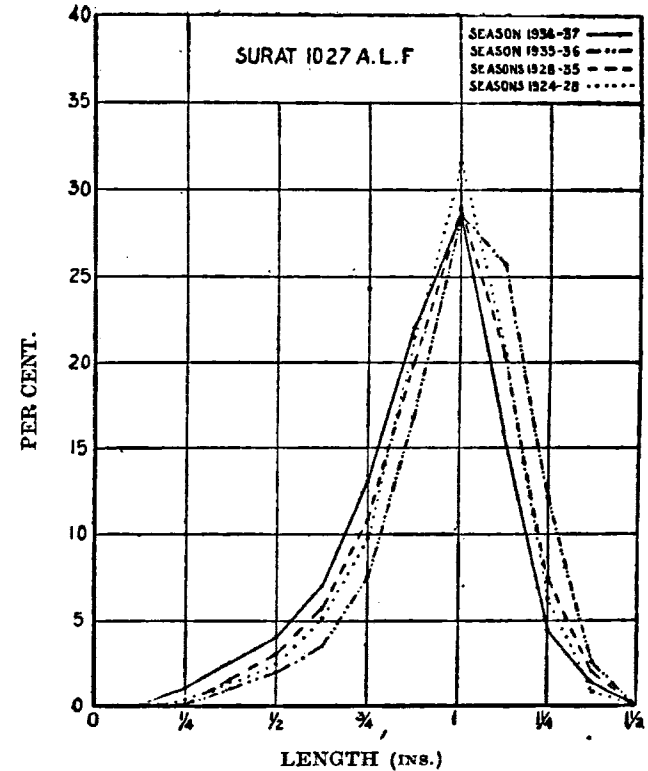


Fig. 3.—Sorter Diagrams for Surat 1027 A.L.F.

IV.—SPINNING TESTS.

1. *Treatment* :—

- (a) *Blow-room* :—Upto 1933-34 :—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times); 1932-33 and 1933-34 twice through the Crighton; 1927-28 direct through the Crighton (once only). 1934-35 onwards :—Hopper bale opener, Horizontal cleaner, Crighton, Gridded dust trunks, Cage exhaust, Hopper Feeder, Scutcher (3 times).
- (b) *Card-room* :—Upto 1934-35 :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank Roving on Ring Frame No. 1. 1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour ..	Creamy white; bright.	White; bright.	White; very bright.	White; very bright.	White; very bright.	White.	White; bright.	White; bright.	White to creamy white; bright.	White; bright.	White; bright.
Cleanliness ..	A little leafy.	Very clean.	Clean.	Very clean.	Perfectly clean.	Clean.	Very clean.	Very clean.	Clean.	Clean.	Clean; contains a little leaf.
Feel ..	Silky and bodied.	Strong and silky but much too soft.	Soft and silky.	Very soft.	Good soft.	Soft silky.	Very good.	Silky bodied.	Good.	Smooth and bodied.	Good smooth.
Ginning and neppleness ..	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds ..	A little cut seed.	..	0.27 per cent. cut seed.	..	..	..	..	..	..	..	..
Card Silver ..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean.	Good clean.
Card-Web ..	..	..	..	..	First class.	Very good.	Even and nep-free.	Good.	Even and nep-free.	Even and nep-free.	A little neppy.
Weight of ten flat strips ..	..	..	..	9.75 grams	7.9 grams.	12.0 grams.	12.8 grams.	13.0 grams.	17.8 grams.	13.6 grams.	11.6 grams.
Remarks ..	A very fine sample.	A deal of licking in the finisher lap; a fine showy cotton.	Plenty of cling; staple even and very strong; a very desirable cotton.	Staple strong & regular in length; a very desirable & showy weft cotton	A very desirable cotton.	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 3 on page 24.

Card Production for Sample 104 :—11.8 lb. per hour.

Ring Frame Production for 30's B, Sample 104 :—3.67 oz. per spindle per 10 hours.

V.—REMARKS.

(i) *Fibre*.—The mean fibre length of this cotton is generally about 0.95", though occasionally it shows fairly large fluctuations, especially since 1933-34. Except in 1929-30 and 1935-36, the fibre-length irregularity of this cotton is rather high. The mean fibre-weight per inch is low in 1933-34 and 1935-36 and high in 1925-26, 1930-31 and 1936-37. The fibre-strength has improved since 1930-31, although the 1935-36 sample is not so strong as its predecessors. The fibre-strength per unit fibre-weight per inch rose to its peak value in 1933-34, but since then has declined steadily. The fibre-rigidity and the number of convolutions per inch both show considerable seasonal variation. The 1936-37 sample is much inferior to its predecessor, being shorter, more irregular in length and coarser than the 1935-36 sample.

(ii) *Waste*.—This is a clean cotton; the blow-room loss being quite low in most seasons. The card-room loss lies between 7 and 8 per cent. and is nearly the same in all seasons.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few in 20's and 30's counts, but fairly numerous in 34's and 40's counts. They were, however, fairly numerous in 20's and 30's counts of the 1932-33 cotton.

(iv) *Yarns*.—Yarns spun from this cotton are either very even to even or even in 20's and even to fairly even in 30's counts. They are, however, inclined to be somewhat neppy. The yarn-strength results are very poor in 1925-26 and again in 1936-37, better than usual in 1929-30 and best of all in 1933-34; otherwise they do not show much seasonal variation.

(v) *Conclusion*.—The 1936-37 sample gave a much poorer performance than its predecessor. The following are the highest standard warp counts for which this cotton has been adjudged suitable :—

1923-24 .. 30's.	1926-27 .. 32's.	1929-30 .. 34's.	1932-33 .. 31's.	1935-36 .. 34's.
1924-25 .. 32's.	1927-28 .. 30's.	1930-31 .. 29's.	1933-34 .. 37's.	1936-37 .. 26's.
1925-26 .. 26's.	1928-29 .. 32's.	1931-32 .. 30's.	1934-35 .. 34's.	

TABLE 3.—SPINNING TEST RESULTS FOR SURAT 1027 A.L.F.

HANK (1936-37).

Card	0.15
Slubber	0.76
Inter	1.71
Rover	4.86

TRAVELLER COUNTS.

20's	3/0
30's	7/0

SPINDLE SPEED (1936-37).

20's A	9,375 r.p.m.
20's B	10,150 r.p.m.
30's	9,450 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.													TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).						
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.				
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).					Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
487	1923-28	19-3-29	20A	5.3	7.5	0.4	12.8	7	185	4.33	16.85	19.7	82.2	6.0	1,619	19.8	133.6	3.4	2,045	20.3	11.0	9.7	1.5	5.8	9.0	2	2.1	16.3	86	66	61	
716	1924-29	23-4-30	..	4.6	7.5	0.4	11.9	17	190	4.44	16.85	19.5	95.9	4.2	1,868	19.8	133.6	3.4	2,045	20.3	11.0	9.7	1.5	5.8	9.0	2	2.1	16.3	86	66	61	
1018	1929-30	23-4-30	..	3.3	7.4	0.3	10.3	8	190	4.55	16.85	19.4	97.1	5.0	1,884	19.8	130.1	3.0	2,470	20.0	11.0	9.8	1.5	5.7	8.6	3	2.6	16.2	91	58	62	
1313	1930-31	9-4-31	..	3.6	6.6	0.6	10.6	4	200	4.49	16.85	20.0	83.2	5.0	1,624	20.2	119.0	3.0	2,404	21.0	11.0	9.8	1.5	5.8	8.4	3	2.1	16.2	89	68	64	
2244	1931-32	10-5-32	..	4.7	6.8	0.5	11.6	16	196	4.32	16.85	19.7	83.1	5.4	1,637	20.1	122.6	3.0	2,404	20.2	11.2	11.0	1.5	5.8	8.4	3	2.0	16.4	89	68	64	
2761	1933-34	23-4-34	..	3.6	6.8	0.4	10.4	23	203	4.35	16.85	19.4	106.0	5.6	2,056	19.4	147.8	3.8	2,887	19.6	11.0	11.0	1.5	5.8	8.5	3	1.1	16.2	86	67	67	
3157	1934-35	26-6-35	..	5.6	6.3	0.5	14.8	19	192	4.22	16.85	19.3	105.1	4.6	2,028	19.2	162.5	4.2	3,126	20.0	13.9	9.9	2.0	7.3	8.3	3	3.1	16.0	87	70	76	
3594/1	1935-36	7-5-36	..	3.0	5.3	0.4	9.0	10	184	4.46	16.85	19.4	97.2	4.2	1,825	20.0	129.4	2.0	2,232	20.0	12.9	9.8	1.0	6.9	8.6	3	1.9	16.0	89	70	70	
3594/2	1936-37	19-5-37	..	5.1	7.8	0.4	11.9	10	208	4.18	16.85	19.7	76.2	6.9	1,601	20.0	114.6	2.0	2,232	20.4	10.6	12.0	4.0	6.6	8.6	3	2.5	16.2	90	70	67	
716	1929-30	23-4-30	20B	..	..	..	..	2	195	4.65	17.98	19.6	99.0	4.1	1,940	19.8	129.4	3.7	2,562	20.0	12.6	8.5	0.5	6.6	8.6	2	2.5	17.2	91	60	63
1018	1930-31	9-4-31	..	..	..	..	..	8	195	4.50	17.98	20.1	87.0	4.4	1,749	20.6	121.3	2.6	2,499	20.4	11.2	10.8	3.5	6.6	8.0	3	1.6	17.2	88	65	64
1313	1931-32	9-5-32	..	..	..	..	..	16	194	4.38	17.98	19.7	89.7	3.9	1,767	20.2	129.2	3.4	2,610	20.1	12.0	10.6	2.0	6.6	8.1	3	2.0	17.5	89	66	67
1735	1932-33	12-4-33	..	3.6	7.4	0.6	11.3	39	196	4.36	17.98	19.8	93.2	5.0	1,845	19.6	144.1	3.9	2,874	20.4	12.2	11.2	3.8	7.1	8.2	3	1.0	17.4	89	65	64	
2244	1933-34	12-4-34	..	..	..	..	..	23	200	4.40	17.98	20.0	105.3	5.7	2,106	20.2	145.5	3.5	2,939	20.0	14.2	9.9	1.0	6.6	7.3	2	1.0	17.2	88	67	68
2761	1934-35	23-4-35	..	..	..	..	..	28	198	4.17	17.98	19.1	111.7	4.6	2,133	19.0	178.7	4.6	3,395	19.4	15.6	9.7	1.0	7.6	8.9	3	2.6	17.2	86	72	74
3157	1935-36	7-5-36	..	..	..	..	..	16	192	4.60	17.98	20.0	99.1	4.1	1,932	20.1	131.8	2.8	2,649	19.6	13.6	10.0	2.0	6.8	7.0	3	1.5	17.2	88	71	70
3594/1	1936-37	17-5-37	..	..	..	..	..	10	208	4.27	17.98	20.2	77.6	4.8	1,668	21.0	106.2	1.9	2,326	21.7	10.3	10.8	3.5	6.4	8.8	3	2.2	17.2	90	69	67
3594/2	1936-37	19-5-37	..	..	..	..	..	5	210	4.33	17.98	19.8	86.9	5.4	1,721	19.7	135.8	4.2	2,675	19.8	12.6	8.8	1.5	6.6	9.2	3	2.2	17.2	89	67	67
487	1923-28	19-3-29	30A	..	..	..	..	6	146	6.42	21.86	29.6	48.6	6.2	1,439	..	..	4.5	2,088	29.3	7.2	12.2	8.3	5.2	11.0	4	2.0	21.6	86	66	63
716	1924-29	23-4-30	..	..	..	..	..	22	167	6.75	21.86	30.4	50.9	5.5	1,547	..	..	4.5	2,088	30.9	7.2	12.1	8.3	5.6	11.5	4	3.3	21.0	89	68	66
1018	1929-30	23-4-30	..	..	..	..	..	5	161	6.81	21.86	29.3	54.1	4.9	1,585	29.4	68.0	2.9	2,522	29.8	7.3	11.5	4.0	5.6	12.7	4	2.8	20.8	92	54	64
1313	1930-31	10-5-32	..	..	..	..	..	35	160	6.61	21.86	30.4	45.4	8.6	1,380	30.5	78.8	2.5	2,438	31.5	6.0	14.8	5.8	5.2	10.6	4	2.1	21.6	87	64	68
1735	1932-33	12-4-33	..	..	..	..	..	8	158	6.95	21.86	29.0	51.6	6.9	1,496	28.9	88.0	2.4	2,543	28.8	8.0	11.6	4.2	6.0	10.5	4	1.4	21.4	89	65	67
2244	1933-34	12-4-34	..	..	..	..	..	36	161	6.35	21.86	29.2	51.9	6.6	1,515	29.2	87.1	2.4	2,543	30.7	7.2	14.2	7.8	6.0	11.0	4	1.4	21.0	89	64	67
2761	1934-35	23-4-35	..	..	..	..	..	21	164	6.48	21.86	29.4	59.8	5.0	1,758	29.6	91.7	3.0	2,714	29.8	8.4	10.8	3.2	5.7	10.0	4	1.2	21.2	88	71	70
3157	1935-36	26-6-35	..	..	..	..	..	16	163	6.33	21.86	30.2	56.6	4.5	1,709	30.4	91.6	3.2	2,785	31.0	8.2	14.0	5.0	6.4	9.2	4	3.0	21.2	87	71	80
3594/1	1936-37	7-5-36	..	..	..	..	..	14	156	6.74	21.86	30.0	53.6	5.6	1,604	30.4	84.0	3.1	2,554	29.8	7.8	13.2	4.8	5.9	9.7	4	1.8	21.2	89	68	70
3594/2	1936-37	17-5-37	..	..	..	..	..	32	164	6.14	21.86	30.6	38.2	10.4	1,169	30.4	74.8	2.4	2,274	31.6	6.2	13.6	5.0	5.8	8.6	5	2.2	20.9	90	67	66
..	1936-37	19-5-37	..	..	..	..	..	50	161	6.11	21.86	30.7	43.1	11.3	1,323	30.7	86.4	2.8	2,652	31.8	6.4	13.1	1.5	5.2	8.1	5	1.6	21.0	89	67	67
..	1923-27	..	30B	..	..	..	..	5	138	6.29	23.11	29.4	49.8	6.4	1,464	..	..	..	..	..	7.5	11.3	8.2	5.1	11.8	4	1.7	22.8	87	68	60
363	1927-28	23-3-28	34	..	..	..	..	11	140	8.18	23.26	33.4	40.5	5.9	1,853	..	..	..	..	..	5.8	16.1	10.2	5.1	15.0	5	2.7	22.9	84	64	71
487	1924-29	19-3-29	..	..	..	..	..	15	144	7.64	23.26	34.0	42.8	5.2	1,455	33.7	59.2	8.6	1,995	33.6	6.4	11.8	5.0	5.7	12.1	5	3.6	22.6	85	64	67
716	1929-30	23-4-30	..	..	..	..	..	27	143	7.73	23.26	33.3	44.9	6.1	1,495	32.9	73.6	2.9	2,520	34.4	5.9	14.1	7.2	4.9	16.7	5	2.6	22.4	91	62	64
1018	1930-31	10-5-32	..	..	..	..	..	51	152	7.42	23.26	33.8	39.3	6.4	1,324	33.9	74.2	4.3	2,515	35.0	5.3	15.2	9.2	5.0	16.0	5	2.4	22.4	89	63	67
1313	1931-32	10-5-32	..	..	..	..	..	29	149	7.23	23.26	33.1	40.0	6.0	1,324	33.6	75.1	2.9	2,523	34.2	6.1	15.0	8.8	5.6	15.7	6	1.9	22.6	89	64	64
1735	1932-33	13-4-33	..	..	..	..	..	74	134	8.30	25.24	39.0	31.0	7.4	1,209	38.2	63.8	3.8	2,437	40.0	5.1	17.0	14.2	5.2	12.4	6	1.2	24.3	89	66	64
2244	1933-34	26-4-34	..	..	..	..	..	33	138	8.65	25.24	39.4	36.9	5.7	1,454	40.0	68.0	3.2	2,720	41.2	5.2	16.0	5.8	4.8	15.7						

4.—WAGAD 8—(DHOLLERAS).

Seasons :

1925-26 (Sample No. 160).	1931-32 (Sample No. 1300).
1926-27 (Sample No. 271).	1932-33 (Sample No. 1774).
1927-28 (Sample No. 372).	1933-34 (Sample No. 2275).
1928-29 (Sample No. 494).	1934-35 (Sample No. 2659).
1929-30 (Sample No. 698).	1935-36 (Sample No. 3115).
1930-31 (Sample No. 1008).	1936-37 (Sample No. 3650).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—Wagad cotton is the best constituent of the commercial crop known as Dholleras, of which it forms about 75 per cent. The most characteristic feature of the Wagad variety is that the bolls do not open when ripe, and are consequently picked entire in one lot, the seed-cotton being extracted later when convenient. Wagad 8 was originally selected in 1917-18; it has been found to be pure since 1919-20, and has been grown on a field scale since 1921-22. (Reference—Memoir of the Department of Agriculture in India Botanical Series, Vol XIV, No. 2, of 1926.)
- (iii) *District of growth* :—North Gujarat-Viramgam Taluka of the Ahmedabad district, North and Western Kathiawar, and Cutch. The particular samples used in these tests have been grown on the Government Farm, Viramgam.
- (iv) *Growing period* :—Sown in the beginning of July, and picked in March.
- (v) *Soil* :—*Besar*—a saltish alluvium derived from the granitic and gneissic rocks of Rajputana and Central India.
- (vi) *Rainfall* :—Variable over the area, averaging from 13 to 30 inches annually; 34.17 inches in 1932-33; 43.34 inches in 1933-34; 21.80 inches in 1934-35; 13.23 inches in 1935-36; 10.84 inches in 1936-37 (dry year).
- (vii) *Temperature* :—Maximum 110° F. Minimum 50° F. Lowest monthly mean 58° F. (January).
- (viii) *Plant particulars (average values)* :—
- Bolls per plant : 7 (spacing : 24" × 9").
 - Seeds per boll : 18.
 - Weight of seed : 68 milligrammes.
 - Weight of lint per seed : 35 milligrammes.
 - Ginning percentage : 42; 36-39 in 1933-34; 43 in 1934-35; 40 in 1935-36; 34 in 1936-37.

(ix) *Yield of seed-cotton* :—

(Viramgam farm) 1923-27 .. 665 lbs. per acre.	(Viramgam farm) 1933-34 .. 602 lbs. per acre.
" 1929-30 .. 556 lbs. "	" 1934-35 .. 640 lbs. "
" 1930-31 .. 513 lbs. "	" 1935-36 .. 458 lbs. "
" 1931-32 .. 842 lbs. "	" 1936-37 .. 117 lbs. "
" 1932-33 .. 625 lbs. "	

(x) *Area under cultivation (average values)* :—

1926-27 .. 60 acres.	1930-31 .. 1,500 acres.
1927-28 .. 250 acres, almost completely ruined by floods.	1933-34 .. 800 acres.
	1934-35 .. 746 acres.
1928-29 .. 20 acres.	1935-36 .. 1,060 acres.
1929-30 .. 105 acres.	1936-37 .. 780 acres (Ahmedabad District.)

II.—GRADER'S REPORT.

	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under .. ..	..	Dholleras.	F. G. Broach.	Dholleras.	Dholleras.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach J/A.
Class	Fine to superfine.	Fine.	Fine to superfine.	Fine.	Fine.	Fine.	Superfine Dhollera.	Fine.	Fully good.	Fully good.	Superfine.	Superfine.
Colour	White.	White.	White.	White.	White.	White.	White.	White.	White.	White.	White.	White.
Staple Length ..	1-1/4 inch.	1/2 inch.	1-1/4 inch.	1/2 inch.	1/2 inch.	1/2 inch.	1/2 inch.	1/2 inch.	1/2 inch.	1/2 inch.	1/2 inch.	11/16 inch.
Staple Strength ..	Good.	Fair.	Weak.	Good.	Poor.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Moderate.
Regularity ..	Regular.	Fair.	Irregular.	Good.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Regular.	Regular.
Value above or below contract rate .. ..	..	Rs. 5 on.	Rs. 8 on.	Rs. 5 on.	Pass.	Rs. 20 on.	Rs. 15 on.	Par.	Par.	Rs. 40 off.	Rs. 10 off.	Par Broach
Basis .. ..	..	Rs. 330.	Rs. 308.	Rs. 354.	Rs. 250.	Rs. 205.	Rs. 180.	Rs. 215.	Rs. 200.	Rs. 245.	Rs. 197.	Rs. 227.
Date of Valuation ..	..	..	17-4-28.	12-4-29.	16-4-30.	26-3-31.	9-4-32.	30-5-33.	23-5-34.	6-3-35.	..	19-6-37.
Remarks .. ..	..	..	..	..	..	..	Soft.	..	..	..	Sample unpressed; cotton badly ginned.	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.											
	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.8	0.4	1.4	1.5	..	0.4	0.9	0.9	1.2	1.0	1.5	0.4
3	2.5	2.1	3.2	2.5	2.3	2.5	3.2	1.8	2.6	2.4	2.6	2.2
4	5.0	5.1	6.4	5.4	5.3	6.1	6.3	4.0	5.5	6.2	6.7	5.6
5	12.4	14.4	14.9	12.3	19.3	17.7	13.1	11.3	15.0	16.9	15.9	12.0
6	30.1	29.3	28.5	26.6	35.7	37.0	27.0	25.2	29.9	30.9	31.5	27.2
7	34.9	31.0	30.7	32.4	27.4	25.4	29.4	30.8	29.7	27.9	29.0	30.8
8	11.1	14.6	12.5	15.4	8.1	8.5	15.5	17.7	13.6	12.0	9.9	16.4
9	2.6	3.1	1.9	3.6	1.9	2.4	4.6	6.4	3.2	3.4	2.7	4.9
10	..	..	0.5	0.3	..	..	..	1.9	0.3	0.8	0.2	0.5
2. Fibre-Length (inch):—												
(a) By Balls Sorter ..	0.79	0.80	0.77	0.80	0.76	0.77	0.79	0.83	0.79	0.78	0.77	0.81
(b) By Baer Sorter ..	0.79	0.81	0.77	0.81	0.75	0.79	0.82	0.84	0.80	0.79	0.78	0.81
3. Fibre-Length Irregularity (%):—												
(a) By Balls Sorter ..	..	..	..	..	10.1	11.3	17.6	14.1	15.9	14.4	15.9	15.2
4. Fibre-Weight per inch (millionth of an ounce):—												
(a) By Balls Sorter ..	0.258	0.204	0.189	0.239	0.195	0.257	0.225	0.240	0.199	0.232	0.216	0.221
5. Fibre-Strength (oz.):—												
(a) By Balls Tester ..	0.143	0.181	0.139	0.137	0.136	0.167	0.171	0.180	0.140	0.154	0.141	0.154
(b) By O'Neill Tester ..	0.141	0.175	0.109	0.151	0.130	0.178	0.172	0.164	0.147	0.166	0.139	0.162
6. Fibre-Strength per unit fibre-weight per inch:—												
(a) By Balls Tester ..	0.55	0.67	0.66	0.60	0.63	0.67	0.76	0.72	0.72	0.69	0.65	0.71
7. Fibre-Rigidity (millionth of an ounce, square inch):—												
(a) By Balls Tester ..	0.162	0.221	0.122	0.135	0.139	0.288	0.231	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch):—												
(a) By Balls Tester ..	0.71	0.72	0.72	0.76	0.77	0.77	0.74	0.82	..	..	..	..
9. Convolutions per inch:—												
(a) By Balls Tester ..	63	45	40	58	56	59	56	79	..	..	..	..
10. Maturity Test Results (%):—												
(a) Mature ..	..	..	..	..	..	..	..	..	..	48	47	58
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	28	27	19
(c) Immature ..	..	..	..	..	..	..	..	..	..	24	26	23

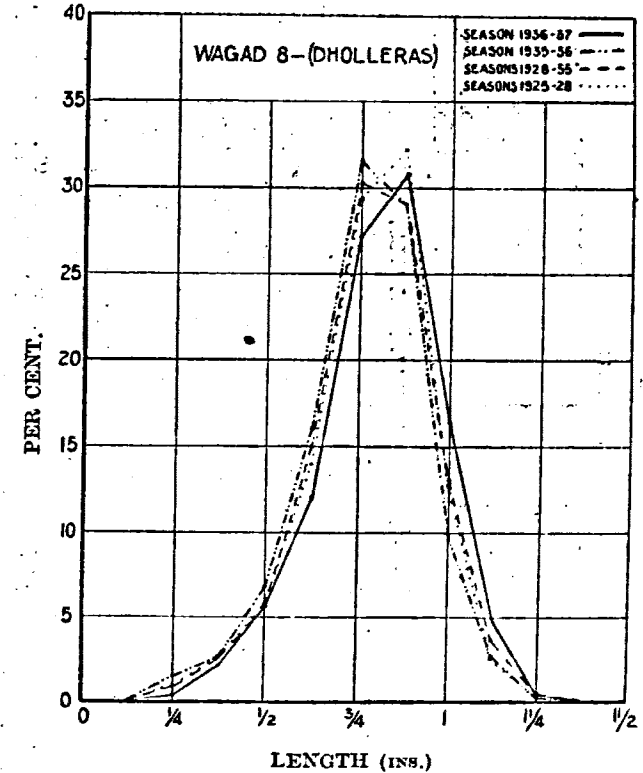


Fig. 4.—Sorter Diagrams for Wagad 8—(Dholleras).

IV. SPINNING TESTS.

1. Treatment.—

- (a) *Blow-room.*—Upto 1934-35 (inclusive):—Lattice feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1925-26 and 1926-27 samples were passed directly through the Crighton (twice). The 1927-28 and 1928-29 samples were passed once through the Crighton. 1935-36 and 1936-37:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).
- (b) *Card-room.*—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37:—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report:—

Season.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White.	Whitish; rather dull.	Creamy white.	White.	White.	White; bright.	White.	White.	White; brightish.	White; brightish.	White; bright.	White to creamy-white.
Cleanliness ..	Leafy.	Leafy.	Leafy (very fine leaf).	Fairly clean.	Fairly leafy.	An occasional stain; fairly leafy.	Fairly clean.	Fairly clean.	Leafy (fine).	Fairly leafy.	Somewhat leafy.	A little leafy; a trifle stained.
Feel .. ..	..	..	Soft and weak.	..	Good.	..	..	Rough.	Slightly rough.	Good.	Roughish.	Fairly good.
Ginning and nep-ness ..	Gin nep present.	Well-ginned.	..	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds	0.5 percent with too much cut seed.	Too much whole seeds present.	Contains 0.5 per cent. un-ginned.	..	A little cut seed present.	..	..	..	Contains a few ginned seeds.	..	..	..
Card Silver ..	..	..	..	..	..	Clean.	A little leafy.	Clean.	Almost clean.	Clean.	Clean.	Clean and good.
Card-Web ..	..	..	..	..	..	Clean and even.	Even and free of nep.	Even and nep-free.	Good.	Good.	Good.	Good and nep-free.
Weight of ten flat strips ..	..	..	..	..	..	12.8 grams.	..	16.0 grams.	17.0 grams.	14.1 grams.	12.5 grams.	16.8 grams.
Remarks ..	..	Staple good.	..	..	Staple is fine, regular and of fair strength.	..	..	..	..	..	..	..

3. Spinning Test Details and Results:—See Table 4, page 28.

V.—REMARKS.

(i) *Fibre.*—This cotton shows considerable seasonal variation in its fibre-properties. The mean fibre-length is unusually high in 1932-33, and low in 1929-30. The fibre-length irregularity is rather high in 1931-32 and low in the previous two seasons. The fibre-weight per inch is low in 1927-28 and 1933-34 and the fibre-strength in 1925-26, 1927-30, 1933-34 and again in 1935-36. The fibre-rigidity is very variable, being less than half in the three consecutive seasons, 1927-30, than in 1930-31. The 1936-37 cotton is longer and somewhat stronger than its predecessor and also possesses a higher percentage of mature fibres.

(ii) *Waste.*—This cotton usually gives about 7-8 per cent. blow-room and 9 per cent. card-room loss, though the 1928-29 sample was cleaner and the 1930-31 and 1936-37 samples dirtier than the others.

(iii) *Breakages.*—Yarn breakages in the ring frame are generally few in 10's counts, but these may be fairly numerous in 12's and 14's counts. Both the 1934-35 and the 1935-36 cottons gave, on the whole, quite few breakages in the ring frame, but the 1936-37 cotton gave fairly numerous breakages both in 12's and 16's counts.

(iv) *Yarns.*—Yarns spun from this cotton are usually very even to even in 10's, and even to fairly even in 14'sA. Its yarns are generally practically free of neps though in 1927-28 and 1929-30, they are rather neppy. The yarn-strength results are better than the usual in 1931-32 and 1933-34, but, in spite of an improvement in mean length, are decidedly poor in 1932-33.

(v) *Conclusion.*—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons:—

1925-26 ..	12's.	1929-30 ..	12's.	1933-34 ..	16's.
1926-27 ..	14's.	1930-31 ..	12's.	1934-35 ..	14's.
1927-28 ..	15's.	1931-32 ..	16's.	1935-36 ..	12's.
1928-29 ..	15's.	1932-33 ..	13's.	1936-37 ..	13's.

5.—SIND SUDHAR.—(289F-1).

Seasons	}	1930-31 (Sample No. 939.)
		1931-32 (Sample No. 1270.)
		1932-33 (Sample No. 1609.)
		1933-34 (Sample No. 2210.)
		1934-35 (Sample No. 2670.)
		1935-36 (Sample No. 3134.)
		1936-37 (Sample No. 3557.)

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*, Linn.
- (ii) *History* :—A selection for high yield and longer staple from Punjab 289F cotton.
- (iii) *District of growth* :—Irrigated area commanded by Barrage canals on left bank of the Indus river in middle and east Sind. The particular samples used in these tests have been grown at the Agricultural Research Station, Sakrand, in Nawabshah district (middle Sind).
- (iv) *Growing period* :—Sowings commence from middle of March and continue upto the end of May. The crop is picked from the third week of October upto the first week of January.
- (v) *Soil* :—Alluvial loam.
- (vi) *Rainfall* :—Variable. The average rainfall is about 5 inches; 0.62" only in 1936 at Sakrand.
- (vii) *Temperature* :—Variable. In middle Sind, the mean maximum temperature remains above 100° F. from March to October. It attains a mean level of above 110° F. in the months of May and June, the maximum temperature reaching about 119° F. on individual days. After October, the temperature begins to fall rapidly and by the end of December it drops and in certain seasons frosts may occur, although pickings may continue upto the middle of January when frosts are very common.
- (viii) *Plant particulars (Average values)* :—
- (a) Bolls per plant : 33 (Spacing 36" × 12").
- (b) Seeds per boll : 27.
- (c) Weight of seed : 98 milligrammes.
- (d) Weight of lint per seed : 43 milligrammes.
- (e) Ginning percentage : 30.6.
- (ix) *Yield of seed cotton per acre* :—

Year.	Agricultural Research Station, Sakrand.	Average of all Govt. Farms in Sind on left-bank of river Indus.
1931-32	1,099 lbs.	..
1932-33	1,568 "	608 lbs.
1933-34	1,860 "	1,540 "
1934-35	1,410 "	1,047 "
1935-36	1,115 "	1,043 "
1936-37	1,131 "	984 "

(x) Area under cultivation :—	Departmental seed.
1932-33	35 acres.
1933-34	1,830 "
1934-35	2,550 "
1935-36	20,445 "
1936-37	82,630 "

II.—GRADER'S REPORT.

—	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach A/M 1937.
Class	Fine.	Fine.	Fine.	Fine.	Fine.	Superfine.	Superfine.
Colour	Creamy	White.	White.	White.	White.	White.	White.
Feel .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	Silky.
Staple Length ..	1½ inch.	1½ inch.	1"–1½"	1½ inch.	1 inch.	Full ¾ inch.	Full 1 inch.
Staple Strength ..	Good.	Good.	Fair.	Good.	Fair.	Very good.	Very good.
Regularity	Good.	Fair.	Fair.	Fair.	Poor.	Regular.	Regular.
Value above or below contract rate ..	Rs. 100 on.	Rs. 85 on.	Rs. 60 on.	Rs. 90 on.	Rs. 80 on.	Rs. 65 on.	Rs. 90 on.
Basis	Rs. 175.	Rs. 230.	Rs. 203.	Rs. 198.	Rs. 245.	Rs. 197.	Rs. 238.
Date of valuation ..	19-12-30.	24-2-32.	12-1-33.	6-4-34.	6-3-35.	8-4-36.	21-4-37.
Remarks .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	Silky, neppy.	Staple strong.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.						
	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0	1.1	0	0.8	1.8	1.2	1.6
3	1.6	1.6	2.5	1.4	2.2	2.9	2.7
4	8.8	8.9	4.1	1.8	2.8	4.2	8.0
5	5.4	7.1	6.5	8.1	4.0	6.1	5.7
6	8.8	12.5	12.3	6.8	7.6	9.9	10.6
7	14.2	24.1	24.6	14.0	16.7	17.0	19.2
8	29.3	29.0	28.7	28.6	27.4	26.9	27.6
9	25.9	15.6	16.8	28.7	26.6	20.5	21.3
10	9.4	4.0	4.5	16.4	9.5	9.2	7.3
11	1.6	1.1	..	4.4	1.9	2.1	1.0
2. Fibre-Length (Inch) :—							
(a) By Balls Sorter	0.97	0.90	0.91	1.03	0.97	0.94	0.94
(b) By Baer Sorter	0.99	0.94	0.90	1.01	0.97	0.93	0.96
3. Fibre-Length Irregularity (%)	19.1	19.4	18.7	16.2	17.7	22.6	21.1
4. Fibre-Weight per inch (millionth of an ounce)	0.146	0.128	0.129	0.181	0.127	0.147	0.138
5. Fibre-Strength (oz.) :—							
(a) By Balls Tester .. .. .	..	..	..	..	0.144	0.153	0.125
(b) By O'Neill Tester .. .. .	..	..	..	..	0.159	0.143	0.133
6. Fibre-Strength per unit fibre-weight per inch	..	..	..	..	1.19	1.01	0.93
7. Maturity test results (%) :—							
(a) Mature .. .. .	..	..	..	..	56	65	69
(b) Half-mature .. .. .	..	..	..	..	30	25	21
(c) Immature .. .. .	..	..	..	..	14	10	10

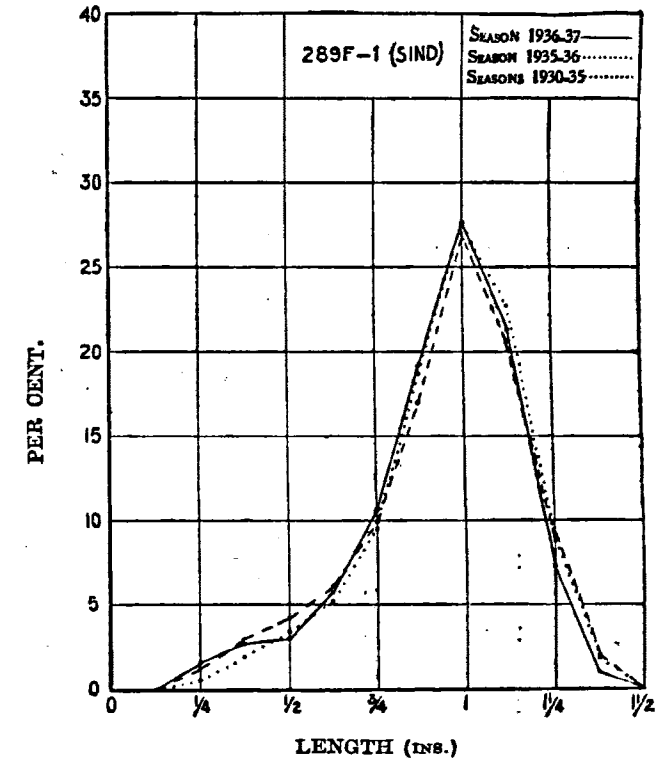


FIG. 5.—Sorter diagrams for Sind Sudhar.

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Up to 1934-35 :—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times).

1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Up to 1934-35 :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

SEASON.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Dullish creamy-white.	White to creamy-white.	White to creamy-white.	White to creamy-white.	Creamy-white.	White to creamy-white; brightish.	Creamy-white to white.
Cleanliness	Somewhat leafy	Fairly clean ..	Fairly clean ..	Fairly clean ..	Much stained; clean.	Fairly clean ..	Fairly clean.
Feel .. .. .	..	Good soft ..	Good	Good bodied ..	Softish ..	Good silky ..	Good soft.
Ginning and neppiness	Charka-ginned; good deal knotted.	Fairly well-ginned.	Well-ginned ..	Well-ginned ..	Knotted ..	Well-ginned ..	Well-ginned.
Seeds	Fair number of undeveloped seeds.	Good deal of undeveloped seeds.	..	1.5% undeveloped seeds.	Some cut seeds	..	..
Card Sliver	Clean; soft and bodied feel.	Clean	Clean	Clean	Clean and soft.	Clean ..	Fairly clean.
Card Web	Good	Even and almost free of nep.	Good	Even but slightly neppy.	Noticeably neppy.	Even and nep-free.	Good but a trifle neppy.
Weight of ten flat-strips.	..	17.6 grams ..	17.9 grams ..	18.5 grams ..	24.9 grams ..	14.7 grams ..	16.7 grams.
Remarks	Staple is long, fine, regular in length and of good strength.	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 5 on Page 32.

V. REMARKS.

(i) *Fibre*.—The mean fibre-length of this cotton shows fairly large seasonal variation, being 12% higher in 1933-34 than in the two preceding seasons. The fibre-length irregularity is rather high in the two seasons, 1930-32 and still higher since 1935-36. The fibre-weight per inch remained fairly constant between 1931—35 but is rather high since then. The 1936-37 sample has practically the same length and length irregularity as its predecessor; it is slightly finer but somewhat weaker.

(ii) *Waste*.—The samples of this cotton have usually given about 7% blow-room and about 10% card-room loss. The 1931-32, 1934-35 and 1936-37 samples, however, are more wasteful than the others.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few in 30's counts but fairly numerous in the higher counts into which this cotton has been spun.

(iv) *Yarns*.—This cotton usually gives even or even to fairly even 30's. Since 1935-36, the yarns are rather more uneven than before. Its yarns are generally somewhat neppy, though in 1930-31 they were quite neppy.

(v) *Conclusions*.—This cotton has given variable performance, its yarn strength results being much better in 1932-33 and 1933-34 than in the other seasons. From its yarn strength results this cotton has been adjudged suitable for the following highest standard warp counts :—

1930-31	..	42's.	1934-35	..	43's.
1931-32	..	42's.	1935-36	..	45's.
1932-33	..	50's.	1936-37	..	42's.
1933-34	..	50's.			

TABLE 5—SPINNING TEST RESULTS FOR SIND SUDHAR (289F-1).

HANK (1936-37).								TRAVELLER COUNTS										SPINDLE-SPEED (1936-37).													
Card	..	..	..	0.18	..	..	..	20's	..	..	..	3/0	..	..	..	20's	..	..	10,250 r.p.m.												
Slubber	..	..	..	0.76	..	..	..	30's	..	..	..	7/0	..	..	..	30's	..	..	9,500 r.p.m.												
Inter	..	..	..	1.76	..	..	..	40's	..	..	..	12/0	..	..	..	40's	..	..	9,500 r.p.m.												
Rover	..	..	..	3.53; 4.09; 5.26.	..	..	..	44's	..	..	..	14/0	..	..	..	44's	..	..	8,775 r.p.m.												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.															TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)			
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.			SINGLE THREAD.									Spinning Room.	Spinning Room.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lb.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (oz.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).	Evenness Class.					Neps per yard.	Turns per inch Actual.
939 3134	1930-31 1935-36	18-12-30 2-4-36	20 20	.. ..	.. ..	.. ..	.. ..	13 20	198 204	6.10 6.12	17.98 17.98	19.9 20.4	91.9 107.2	12.5 6.4	1,829 2,187	.. 20.3	.. 159.4	.. 4.4	.. 3,236	19.9 20.9	14.9 15.4	18.3 11.5	12.0 8.2	6.3 6.3	11.6 9.6	2 2	4.0 1.5	17.3 17.1	81 86	69 65	67 73
3557/1 3557/2	1936-37 1936-37	7-4-37 8-4-37	20 20	.. ..	.. ..	.. ..	.. ..	6 6	218 218	6.05 6.05	17.98 17.98	20.6 20.1	99.2 106.0	4.6 7.5	2,044 2,131	20.4 18.6	147.0 152.4	8.4 5.6	2,999 2,987	21.3 20.6	13.6 14.7	10.4 9.9	1.0 3.0	6.4 6.4	7.0 8.7	4 3	2.2 2.0	17.1 17.1	86 86	68 68	67 68
939 1270	1930-31 1931-32	18-12-37 2-3-32	30 30	7.0 10.0	9.5 10.3	0.5 0.6	16.2 19.8	8 21	164 160	6.41 7.22	21.86 21.86	30.4 29.5	68.6 65.9	13.0 4.3	1,933 1,944	.. ..	.. ..	.. ..	.. ..	82.5 30.0	9.3 10.0	14.7 10.0	7.0 5.0	5.4 6.2	10.5 7.7	3 4	5.7 2.7	20.9 21.5	81 85	70 69	68 65
1609 2210	1932-33 1933-34	12-1-33 7-4-34	30 30	6.9 6.7	10.2 11.8	0.6 0.3	16.9 18.0	30 0	161 164	7.35 7.73	21.86 21.86	29.9 30.5	73.6 68.6	4.2 7.4	2,201 2,092	.. ..	.. ..	.. ..	.. ..	29.0 30.4	10.6 9.6	13.2 15.0	5.0 6.0	6.8 6.3	9.6 9.2	3 3	3.0 1.0	21.4 21.1	80 89	65 69	72 70
2670 3134	1934-35 1935-36	8-3-35 2-4-36	30 30	9.7 8.4	13.7 9.8	0.6 0.4	22.5 17.2	20 2	167 159	7.57 8.00	21.86 21.86	31.5 29.6	58.3 65.0	5.2 8.3	1,836 1,924	.. 29.8	.. 101.5	.. 2.6	.. 3,025	30.7 30.0	7.2 10.0	11.4 14.4	0 8.5	5.8 5.6	12.3 12.0	4 4	4.0 2.1	21.2 21.0	79 86	65 66	69 72
3557/1 3557/2	1936-37 1936-37	8-4-37 8-4-37	30 30	11.2 11.2	10.3 10.2	0.4 0.5	20.7 20.7	0 7	162 160	7.88 8.03	21.86 21.86	30.9 30.6	57.8 56.9	6.8 9.1	1,766 1,758	31.1 30.1	94.4 91.6	2.8 3.4	2,936 2,757	31.8 30.7	8.8 9.1	11.7 11.9	5.0 6.0	6.3 5.6	6.4 8.3	5 5	1.8 2.2	21.1 20.8	85 86	66 67	67 67
939 1270	1930-31 1931-32	19-12-30 1-3-32	40 40	.. ..	.. ..	.. ..	.. ..	11 27	142 138	8.33 8.39	25.28 25.28	40.8 40.2	39.7 40.9	14.9 6.3	1,620 1,644	.. ..	.. ..	.. ..	.. ..	42.0 41.3	7.0 6.7	15.6 14.3	9.0 6.0	5.0 5.5	14.7 11.8	5 4	2.2 4.2	24.4 24.6	81 83	69 65	69 67
1609 2210	1932-33 1933-34	13-1-33 7-4-34	40 40	.. ..	.. ..	.. ..	.. ..	29 22	139 144	7.71 8.00	25.28 25.28	39.7 39.4	51.1 49.3	4.9 5.6	2,029 1,942	.. ..	.. ..	.. ..	.. ..	39.8 40.3	8.0 6.9	8.8 12.7	2.0 4.0	6.7 5.8	7.8 14.0	4 4	2.8 0.8	24.5 24.4	81 88	67 70	72 69
2670 3134	1934-35 1935-36	9-3-35 4-4-36	40 40	.. ..	.. ..	.. ..	.. ..	44 10	144 137	7.94 7.57	25.28 25.28	39.9 38.8	43.6 48.2	6.4 6.0	1,740 1,870	.. 39.0	.. 83.0	.. 2.8	.. 3,237	40.3 39.6	6.0 7.6	15.6 13.0	8.0 5.5	5.8 5.2	10.2 7.4	5 4	4.5 2.2	24.3 24.4	80 87	64 66	66 72
3557/1 3557/2	1936-37 1936-37	9-4-37 20-4-37	40 40	.. ..	.. ..	.. ..	.. ..	19 15	139 137	7.64 7.65	25.28 25.28	40.7 39.0	40.1 44.9	6.6 6.7	1,632 1,751	41.3 37.9	75.2 80.0	3.1 3.3	3,106 3,032	40.9 38.6	6.2 7.2	14.3 9.6	7.5 2.5	5.8 5.2	9.3 7.8	6 6	2.0 2.0	24.2 24.4	86 90	67 67	67 67
1270 1609	1931-32 1932-33	29-2-32 11-1-33	44 44	.. ..	.. ..	.. ..	.. ..	20 27	131 131	8.97 8.98	26.75 26.75	44.3 43.9	35.5 43.8	6.2 4.8	1,573 1,923	.. ..	.. ..	.. ..	.. ..	45.5 44.6	5.8 6.7	11.6 12.2	9.0 4.0	5.1 6.0	12.1 8.4	5 5	5.5 2.8	26.2 26.2	84 80	68 68	64 72
2210 2670	1933-34 1934-35	6-4-34 11-3-35	44 44	.. ..	.. ..	.. ..	.. ..	18 57	136 136	8.75 8.83	26.75 26.75	44.3 45.6	43.2 34.8	5.6 11.1	1,914 1,587	.. ..	.. ..	.. ..	.. ..	45.2 43.1	5.9 5.0	11.3 17.0	1.0 12.0	4.9 5.0	15.5 18.5	4 6	0.8 5.0	26.0 25.9	88 79	69 62	68 68
3134 3557/1	1935-36 1936-37	7-4-36 12-4-37	44 44	.. ..	.. ..	.. ..	.. ..	14 20	130 120	8.56 8.38	26.75 26.75	42.8 43.4	40.0 36.6	5.4 5.8	1,712 1,588	43.2 43.8	72.4 71.0	3.0 2.9	3,128 3,110	43.4 43.4	6.6 5.9	14.3 13.8	5.8 5.0	5.2 5.8	8.2 8.2	5 7	1.8 2.0	25.9 25.9	86 87	65 67	71 67
3557/2	1936-37	20-4-37	44	..	..	..	..	25	118	8.94	26.75	43.3	36.1	5.8	1,663	44.8	67.2	4.2	3,011	46.1	5.6	13.9	7.5	4.7	10.8	7	2.2	26.0	90	67	69
2210	1933-34	9-5-34	50	..	..	..	..	24	125	10.19	28.16	50.5	32.8	7.5	1,056	..	..	..	..	48.9	5.1	13.8	2.0	4.7	13.5	6	1.0	27.0	88	69	

*Diameter of ring frame front roller—1". Diameter of rings—1 1/4".

6.—SIND N. R.—(W. N. 27).

Seasons.

1929-30 (Sample No. 785).	1933-34 (Sample No. 2213).
1930-31 (Sample No. 945).	1934-35 (Sample No. 2672).
1931-32 (Sample No. 1279).	1935-36 (Sample No. 3135).
1932-33 (Sample No. 1610).	1936-37 (Sample No. 3558).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species*:—*Gossypium neglectum* Var-Rosea.
- (ii) *History*:—A selection from ordinary *deski* for high yield and high ginning outturn. It is narrow lobed variety having white flowers.
- (iii) *District of growth*:—Middle and North Sind and Right Bank of the Indus river. The particular samples used in these tests have been grown at the Agricultural Research Station, Sakrand in Nawabshah District (Middle Sind).
- (iv) *Growing period*:—Sowings commence from April and continue upto mid-June. The crop is picked from middle of September to December end.
- (v) *Soil*:—Alluvial loam.
- (vi) *Rainfall*:—Variable. The average rainfall is about 5 inches; 0.62" only in 1936 at Sakrand.
- (vii) *Temperature*:—Variable. In Middle Sind, the mean maximum temperature remains above 100° F. from March to October. It attains a mean level of above 110° F. in the months of May and June, the maximum temperature reaching about 119° F. on individual days. After October, the temperature begins to fall rapidly and by the end of December it drops and in certain seasons frosts may occur, although pickings may continue upto the middle of January when frosts are very common.
- (viii) *Plant Particulars (Average values)*:—
- Bolls per plant: 56 (spacing 36" x 12").
 - Seeds per boll: 32.
 - Weight of seed: 50 milligrammes.
 - Weight of lint per seed: 33 milligrammes.
 - Ginning percentage: 40.
- (ix) *Yield of seed-cotton per acre*:—

Year.	Agricultural Research Station, Sakrand.	Average of all Govt. Farms in Sind on Left-Bank of Indus River.
1930-31	1,840 lbs.	..
1931-32	1,652 "	..
1932-33	1,501 "	897 lbs.
1933-34	1,388 "	1,070 "
1934-35	1,552 "	783 "
1935-36	1,266 "	880 "
1936-37	865 "	930 "

(x) *Area under cultivation*:—

Year.	Cultivation from Departmental seed.	Cultivation from seed of other sources.
1931-32	2,000 acres.	..
1932-33	6,000 "	..
1933-34	1,58,900 "	..
1934-35	13,310 "	..
1935-36	9,500 "	About 2,00,000 acres.
1936-37	12,840 "	Do.

II.—GRADER'S REPORT.

—	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under.	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.	F. G. Bengal.	F. G. Bengal.
Class	Barely fine.	Extra Super-fine.	Extra Super-fine.	Extra Super-fine.	Extra Super-fine.	Extra Super-fine.	Choice Super-fine.
Colour	Dull white.	White.	White.	White.	White.	Bright white.	Bright white.
Feel .. .. .	..	..	..	..	..	Very roughish style.	Very roughish style.
Staple length ..	‡ inch.	‡‡ inch.	‡ inch.	‡‡ inch.	‡ inch.	‡ inch.	‡ inch.
Staple strength ..	Fair.	Poor.	Fair.	Fair.	Fair.	Fair.	Fair.
Regularity	Fair.	Fair.	Fair.	Fair.	Poor.	Regular.	Regular.
Value above or below contract rate ..	Rs. 5 on.	Rs. 25 on.	Rs. 40 on.	Rs. 80 on.	Rs. 20 on.	Rs. 25 on.	Rs. 50 on.
Basis	Rs. 130.	Rs. 180.	Rs. 163.	Rs. 133.	Rs. 141.	Rs. 150.	Rs. 185.
Date of valuation ..	7-1-31.	14-3-32.	12-1-33.	6-4-34.	6-3-35.	8-4-36.	1-5-37.
Remarks .. .. .	..	..	..	..	..	..	Boughish Sind was bought largely in Europe probably for mixing with wool. Demand exceeding supplies; hence sold abnormally high, even over Broach rate.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.							
	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	1.4	2.6	2.1	1.9	1.3	1.6	1.8	1.7
3	8.2	7.2	8.7	6.1	3.9	3.8	3.0	3.4
4	10.5	17.5	12.4	22.1	11.4	10.9	10.2	10.0
5	28.3	37.1	33.2	33.3	28.5	23.7	32.4	31.9
6	38.4	24.4	30.7	22.1	31.3	34.7	35.6	37.6
7	14.6	8.6	13.8	7.6	15.3	15.8	13.1	12.0
8	3.6	2.6	4.8	1.9	5.7	4.3	3.6	3.0
9	..	..	..	..	2.6	0.2	0.8	0.4
2. Fibre-Length (inch):—								
(a) By Balls Sorter	0.70	0.64	0.68	0.63	0.71	0.70	0.70	0.69
(b) By Baer Sorter	0.68	0.60	0.68	0.62	0.70	0.69	0.68	0.68
3. Fibre-Length Irregularity (%)	14.1	16.0	13.3	13.5	13.6	14.7	11.8	13.1
4. Fibre-Weight per inch (millionth of an ounce).	0.349	0.333	0.307	0.299	0.293	0.263	0.257	0.272
5. Fibre-Strength (oz.):—								
(a) By Balls Tester	..	..	..	..	..	0.208	0.174	0.180
(b) By O'Neill Tester	..	..	..	..	..	0.218	0.178	0.188
6. Fibre-Strength per unit fibre-weight per inch.	..	..	..	..	..	0.81	0.68	0.68
7. Maturity Test Results (%):—								
(a) Mature	..	..	..	..	..	77	66	85
(b) Half-mature	..	..	..	..	..	17	26	7
(c) Immature	..	..	..	..	..	6	8	8

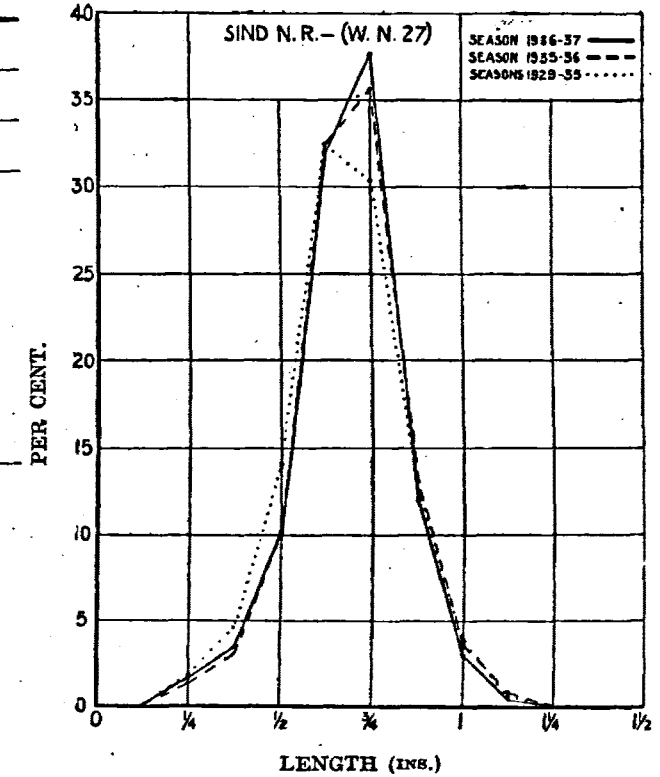


Fig. 6.—Sorter Diagrams for Sind N. R.

IV. SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1934-35 (inclusive):—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1930-31 and 1931-32 samples were passed through the Crighton (once only). The 1929-30 sample was passed direct through the Crighton (once only).

1935-36 and 1936-37:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report*:—

Season.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy-white.	White to creamy-white.	White to creamy-white.	White; bright	White to creamy-white.	White.	White; bright	White.
Cleanliness	Clean.	A little leafy.	Clean.	Clean.	Clean.	Clean.	Clean.	Very clean.
Feel	Harsh.	Harsh.	Rough.	Rough.	A little rough.	Rough.	Roughish.	Rough.
Ginning and neppiness..	Fairly well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds .. .. .	..	..	Clean..	Clean..	Clean..	Clean.. and rough.	Clean..	Good.. and very clean.
Card-alliver .. ..	..	..	..	..	..	..	..	Good.. and very clean.
Card-web .. .. .	..	..	Almost even and nep-free.	Even and nep-free.	..	..	Even and nep-free.	Good.. and nep-free.
Weight of ten flat strips.	..	..	12.5 grams.	12.5 grams.	14.1 grams.	14.8 grams.	9.9 grams.	11.2 grams.
Remarks	Staple is short, wiry and strong.	..	..	..	..	..	..	..

3. *Spinning Test Details and Results*.—See Table 6, page 36.

V. REMARKS.

(i) *Fibre*.—The fibre properties of this cotton show fair amount of seasonal variation. The mean fibre-length is unusually low in 1930-31, and again in 1932-33. The fibre-length irregularity is rather high in 1930-31 and low in 1935-36. The fibre-weight per inch shows a progressive decrease since 1929-30, the 1935-36 value being in comparison 26% less. The 1936-37 sample has very nearly the same mean length as its predecessor, but it is less regular in length; it is somewhat coarser and possesses a higher percentage of mature hairs.

(ii) *Waste* :—Except in 1930-31 and 1936-37 the samples of this cotton have been supplied in a fairly clean condition and have yielded moderately low blow-room loss. The card-room loss is generally 9-10%.

(iii) *Breakages* :—Even in 6's counts this cotton has given very numerous yarn breakages in the ring frame in some seasons. The 1936-37 sample gave few breakages in the 6's count, but fairly numerous in the 8's count.

(iv) *Yarns* :—This cotton usually gives either even or even to fairly even yarns in 6's and 8's counts, those of 1931-32 being more even than the others. Its yarns are practically free of neps.

(v) *Conclusions* :—As will be seen from the following table this cotton showed an improvement in performance in 1933-35 which, however, has not been maintained in the two subsequent seasons. From its yarn strength results it has been adjudged suitable for spinning upto the following highest standard warp counts in the different seasons :

1929-30 .. 6's	1932-33 ... 6's	1935-36 .. 7's
1930-31 .. 6's	1933-34 .. 8's	1936-37 .. 7's
1931-32 .. 6's	1934-35 .. 9's	

N.B.—Although the 1929-30, 1930-31 and 1932-33 cottons are shown suitable for spinning upto 6's standard warp counts, they (especially the 1930-31 cotton) in actual fact are inferior to the 1931-32 cotton.

TABLE 6.—SPINNING TEST RESULTS FOR SIND N. R. (W. N. 27).

HANK (1936-37).
 Card 0.13
 Slubber.. .. . 0.52
 Inter 0.90
 Rover .. 1.34; 1.68; 1.96

TRAVELLER COUNTS.
 6s A 9
 8s A 7
 8s B 7
 10s 5

SPINDLE SPEED (1936-37).
 6 5,450 r.p.m.
 8A 6,600 r.p.m.
 8B 6,700 r.p.m.
 10 7,300 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch.—lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.		Extension (%)	Extension Irregularity (%)				Evenness Class.	Neps per yard.	Turns per inch Actual.
785 945 1279	1929-30 1930-31 1931-32	12-7-30 30-12-30 7-3-32	6A .. ..	.. .. ..	.. .. ..	.. .. ..	150 171 27	190 170 193	3.06 3.85 4.08	9.87 9.87 9.87	5.9 5.8 6.0	79.8 59.5 101.4	10.4 6.0 12.4	438 345 608	.. .. ..	.. .. ..	.. .. ..	6.2 6.0 6.0	11.4 14.9 19.0	19.8 23.2 19.2	17.5 24.0 9.0	7.2 7.7 10.8	11.6 17.7 10.2	3 4 2	1.0 1.0 0.8	9.3 9.4 9.5	86 82 82	74 67 58	67 69 64	
3135 3558/1 3558/2	1935-36 1936-37 1936-37	7-4-36 21-4-37 21-4-37	.. .. ..	4.8 5.2 6.5	8.6 9.1 9.2	0.4 0.3 0.4	13.4 15.0 15.4	20 0 208	5.13 4.90 4.90	9.87 9.87 9.87	6.6 6.5 6.2	93.2 109.0 117.3	5.7 9.1 7.4	615 708 727	6.4 6.4 6.1	293.0 277.2 324.0	5.0 3.4 3.5	1,875 1,774 1,976	6.4 6.8 6.8	18.2 16.7 18.2	17.1 20.4 17.9	11.0 18.5 14.5	8.8 7.9 8.2	9.5 9.7 10.2	3 8 3	0.4 0.5 0.2	9.5 9.5 9.8	87 90 90	64 64 69	71 71 72	
785 945	1929-30 1930-31	12-7-30 30-12-30	6B ..	4.2 7.2	23.3† 11.1	1.1 0.6	32.0 18.0	75 135	210 193	3.16 3.85	11.08 11.09	0.2 5.9	100.5 89.3	6.3 9.0	623 527	.. ..	.. ..	.. ..	6.5 6.3	16.6 17.8	16.3 14.8	10.0 8.0	9.7 8.2	7.0 10.9	3 4	1.2 1.0	10.8 10.6	86 82	73 67	72 69
1279 1610 2213 2672	1931-32 1932-33 1933-34 1934-35	7-3-32 13-1-33 1-5-34 18-3-35	8A	4.5 3.4 8.0 4.7	10.8 9.4 10.9 8.2	0.7 0.7 0.5 0.2	15.4 13.1 15.8 12.7	142 218 65 0	185 181 185 185	5.43 5.10 4.80 5.00	11.31 11.31 11.31 11.31	8.2 7.8 7.3 7.9	49.4 60.2 72.7 85.7	15.7 10.7 9.1 6.0	405 392 587 677	.. .. .. ..	.. .. .. ..	.. .. .. ..	8.3 8.0 8.0 8.0	11.4 11.7 15.4 15.7	18.3 28.9 15.5 17.9	15.0 22.0 11.0 12.0	8.0 8.4 7.9 9.2	10.8 11.7 10.9 9.4	8 4 3 4	0.8 0.5 0.5 0.5	10.8 11.0 10.6 11.0	82 81 89 84	64 64 69 70	64 73 67 70
3135 3558/1 3558/2	1935-36 1936-37 1936-37	7-4-36 21-4-37 21-4-37	33 33 22	191 224 224	5.10 5.20 5.10	11.31 11.31 11.31	8.2 8.6 8.4	71.5 67.5 68.7	7.6 10.4 13.5	586 580 577	8.3 8.7 8.0	216.6 188.6 218.4	3.0 4.0 4.7	1,798 1,643 1,747	8.2 8.9 8.2	14.2 11.2 13.8	18.0 19.6 19.7	12.8 17.0 16.5	8.1 7.1 7.6	10.2 14.9 8.6	4 4 4	0.4 0.2 0.5	10.9 10.8 10.7	87 90 90	65 66 68	70 72 72	
1279 1610 2213 2672	1931-32 1932-33 1933-34 1934-35	16-3-32 13-1-33 2-5-34 18-8-35	8B .. .. ..	.. .. .. ..	.. .. .. ..	.. .. .. ..	.. .. .. ..	87 175 55 22	182 196 196 192	4.90 5.00 5.00 5.13	12.07 12.07 12.07 12.07	8.1 7.9 8.2 8.0	77.3 71.6 83.1 104.8	5.2 6.4 7.8 7.3	626 566 681 838	.. .. .. ..	.. .. .. ..	.. .. .. ..	8.3 8.0 8.2 8.1	13.7 16.0 16.8 18.5	16.6 19.3 16.1 13.9	13.0 16.0 11.0 9.0	8.6 9.2 7.9 9.5	11.8 12.7 10.9 8.8	3 4 3 4	1.0 0.8 0.8 0.8	11.6 11.7 11.3 11.7	83 81 87 84	74 67 71 70	66 72 64 68
3135 3558/1 3558/2	1935-36 1936-37 1936-37	7-4-36 21-4-37 21-4-37	0 33 44	191 208 208	5.10 5.20 5.20	12.07 12.07 12.07	8.2 8.2 8.3	96.2 99.1 92.3	8.1 8.9 5.3	789 813 768	7.9 8.1 8.4	267.6 245.2 226.0	4.4 3.5 3.2	2,114 1,986 1,898	8.2 8.1 8.2	17.2 17.4 16.2	13.5 14.0 15.7	7.8 10.0 10.0	8.8 8.3 8.0	9.6 8.6 11.4	4 4 4	0.5 0 0.5	11.6 11.2 11.4	87 89 90	67 67 67	71 72 72	
1610 2213 2672	1932-33 1933-34 1934-35	13-1-33 2-5-34 15-3-35	10 .. ..	.. .. ..	.. .. ..	.. .. ..	.. .. ..	273 144 27	172 178 169	5.60 6.13 5.53	13.58 13.58 13.58	9.8 10.0 9.3	45.5 55.3 80.8	11.1 12.5 7.3	446 553 972	.. .. ..	.. .. ..	.. .. ..	10.1 10.3 9.7	10.6 12.8 15.0	26.8 18.3 16.4	24.0 15.0 9.0	7.8 7.0 9.4	9.5 12.8 7.1	5 4 5	0.5 0.8 0.5	13.3 13.0 13.0	82 87 82	69 71 71	74 69 74
3135 3558/1 3558/2	1935-36 1936-37 1936-37	8-4-36 15-4-37 15-4-37	34 9 55	174 198 197	5.48 5.55 5.55	13.58 13.58 13.58	10.2 10.2 10.6	68.0 75.4 60.6	10.4 10.1 11.5	694 769 642	10.0 10.3 10.8	192.4 181.6 176.0	3.0 3.8 3.2	1,924 1,879 1,813	10.3 10.2 10.9	13.0 12.8 11.1	18.0 21.5 17.6	11.0 17.5 11.0	8.0 7.3 7.2	9.9 11.4 9.8	5 5 5	0.4 0.5 0.2	13.1 12.8 12.9	87 90 90	67 68 68	73 71 74	

* Diameter of ring frame front roller—1". Diameter of rings—1½".

† High cardroom loss is due to very small size of the sample.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.2	..	0.4	0.2	0.9	0.8	0.3	0.7	0.7	0.8	0.8	0.5	1.0
3	2.0	1.8	1.8	2.3	2.5	1.9	2.7	2.7	2.8	2.9	1.9	2.4	3.3
4	4.9	4.5	5.4	4.8	6.0	4.6	5.3	9.0	6.6	9.1	4.4	5.4	7.1
5	11.6	10.5	15.4	13.6	16.9	11.4	16.7	30.1	17.0	25.6	12.2	12.8	16.8
6	25.5	24.5	33.2	32.7	35.6	26.8	34.0	35.1	30.7	37.9	30.7	29.0	33.2
7	37.6	39.6	29.3	33.8	27.9	35.5	27.9	15.8	23.0	18.3	33.0	33.2	20.6
8	14.5	12.1	12.0	10.2	8.1	14.0	8.8	5.9	11.1	4.7	13.4	12.1	9.4
9	3.3	2.3	2.5	2.1	2.1	4.2	2.8	0.7	3.1	0.7	3.1	3.6	2.6
10	0.4	0.7	..	0.3	..	0.2	0.4	..	..	..	0.5	1.0	..
11	..	..	..	..	..	..	0.2	..	..	..	..	..	..
2. Fibre-Length (inch):—													
(a) By Balls Sorter ..	0.81	0.81	0.79	0.79	0.76	0.81	0.77	0.72	0.77	0.72	0.80	0.80	0.76
(b) By Baer Sorter ..	0.80	0.82	0.77	0.79	0.76	0.82	0.77	0.73	0.78	0.74	0.83	0.81	0.76
3. Fibre-Length Irregularity (%):—													
.. .. ..	..	..	..	..	..	14.9	11.5	10.7	14.9	12.4	13.3	15.0	15.2
4. Fibre-Weight per inch (millionth of an ounce):—													
..	0.177	0.174	0.134	0.180	0.197	0.155	0.198	0.161	0.143	0.140	0.142	0.175	0.157
5. Fibre-Strength (oz.):—													
(a) By Balls Tester ..	..	..	0.134	0.148	0.168	0.166	0.178	0.128	0.147	0.150	0.130	0.186	0.160
(b) By O'Neill Tester ..	..	..	0.130	0.165	0.170	0.168	0.185	0.134	0.141	0.144	0.142	0.175	0.175
6. Fibre-Strength per unit fibre-weight per inch:—													
.. .. ..	..	..	0.99	0.84	0.86	1.08	0.92	0.81	1.01	1.05	0.96	1.03	1.07
7. Fibre-Rigidity (millionth of an ounce, square inch):—													
.. .. ..	..	..	0.093	0.210	0.234	0.215	0.226	0.156	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch):—													
..	0.70	0.70	0.70	0.70	0.68	0.69	0.71	0.70	0.74	..	..	..	..
9. Convolutions per inch:—													
..	103	115	104	102	99	107	110	98	108	..	..	..	..
10. Maturity Test Results (a):—													
(a) Mature .. .. ..	..	..	..	..	..	..	..	..	..	..	..	43	49
(b) Half-mature .. ..	..	..	..	..	..	..	..	..	..	..	..	27	23
(c) Immature .. .. ..	..	..	..	..	..	..	..	..	..	..	..	30	28

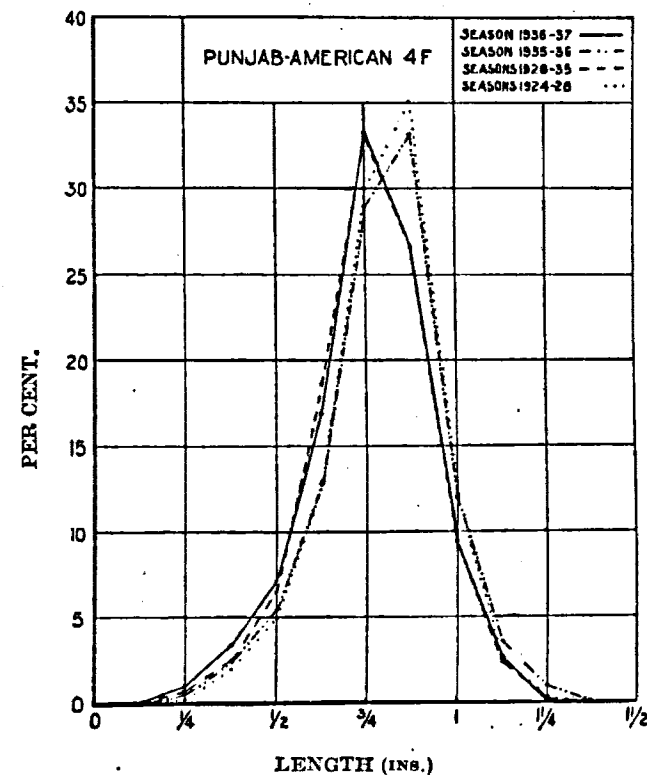


Fig. 7.—Sorter Diagrams for Punjab-American 4 F.

1. *Treatment* :—

IV. SPINNING TESTS.

(a) *Blow-room*—Upto 1933-34 (inclusive):—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times).

1934-35 onwards (inclusive):—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37:—Same as above but spun from single hank roving on Ring frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy to creamy-white.	White to creamy-white; bright.	Creamy-white; fairly bright.	White; bright.	White; bright.	White.	White.	White; brightish.	White to creamy-white.	White; bright.	White.
Cleanliness	Very leafy.	Fairly clean.	A trifle leafy.	Leafy.	Fairly clean.	Shows occasional stain; fairly leafy (very fine leaf).	Somewhat leafy.	Fairly clean.	Leafy; a little stained.	A little leafy.	Fairly clean.
Feel .. ..	..	Good.	Silky and bodied.	Nice soft.	Very good.	Softish.	Fairly good	Good smooth.	Good.	Good.	Good soft.
Ginning and nep-piness.	Neppe and knotted.	Well-ginned.	Well-ginned.	Knotted and neppe.	Well-ginned.	Well-ginned.	Well-ginned, except for some knottiness.	Well-ginned.	Somewhat knotted.	Well-ginned.	Well-ginned.
Seeds	A few full clean and 1.11% undeveloped seeds.	..	..	..	..	..	..	..	..	..	..
Card-silver .. ..	..	..	..	..	Clean.	Clean.	Almost clean.	Clean.	Clean.	Clean.	Good clean.
Card-web	Neppy.	..	..	Fairly clear.	Very good.	Even and nep-free.	Good.	Even and nep-free.	Good.	Good.	Good but a little neppy.
Weight of 10 flat strips	..	..	..	..	16.3 grams.	16.1 grams.	15.1 grams.	16.1 grams.	24.6 grams.	14.6 grams.	24.8 grams.
Remarks	Blow-room waste mostly leaf with undeveloped seeds and a little short stuff.	A good sample.	Very good cotton. Spinning speed reduced in 20's owing to frequent yarn breakages.	Staple regular and strong.	Fully pressed.	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 7, page 40.

Card Production for Sample 81 :—11.7 lb. per hour.

Ring Frame Production for 20's A, Sample 81 :—7.71 oz. per spindle per 10 hours.

V. REMARKS.

Fibre.—Among the Khanewal samples, the fibre-length is rather low in 1928-29 and 1930-31. The fibre-weight per unit length and the fibre-rigidity show much seasonal variation, both being very low in 1926-27 and high in 1928-29. The fibre-strength shows a progressive increase from 1926-27, when it was first measured. The Lyallpur samples are distinctly short in 1931-32, 1933-34 and 1936-37, from 1932 to 1935 and again in 1936-37 they are much finer and possess higher fibre-strength per unit fibre-weight per inch than the Khanewal samples. The 1936-37 sample is 5% shorter and 6% weaker than its predecessor; it is, however, 10% finer, which gives it a somewhat, high intrinsic strength and it also possesses a higher percentage of mature fibres.

Waste.—Waste losses in the blow-room and the card-room are rather high in the two seasons, 1928-30. The card-room loss is also high in 1934-35, but the two losses, especially the card-room loss is particularly high in 1936-37.

Breakages.—Yarn breakages in the ring frame are fairly numerous in the 20's B counts in the three seasons, 1928-31, and in 1936-37 and numerous in the same count in the following three seasons. They are very numerous in 24's B counts in the two seasons, 1932-34 and in 30's counts in 1933-34.

Yarns.—This cotton generally gives even to fairly even 20's, but the 1928-29 yarns are less, while those of 1930-32 and 1935-36 are more even than usual. Its yarns are usually nep-free or slightly neppy, but those of the two seasons 1928-30 are rather neppy. These two seasons were, in fact, bad for this cotton, when its yarns, besides being unusually uneven and neppy, were very weak. In 1931-32 its yarns are just as weak as in 1929-30, but they are satisfactory in respect of evenness and neppiness.

Conclusions.—Upto 1927-28, the yarn strength results do not show much seasonal variation but 1928-29 witnessed a big decline, from which the cotton appears to have recovered somewhat in the following seasons. The Lyallpur samples from 1932-33 onwards are superior to the 1931-32 sample and gave stronger yarns than any of the Khanewal samples. The following are the highest standard warp counts for which the cotton is adjudged suitable in the different seasons:—

1924-25 .. 22's	1928-29 .. 16's	1931-32 .. 20's	1934-35 .. 27's
1925-26 .. 22's	1929-30 .. 20's	1932-33 .. 25's	1935-36 .. 26's
1926-27 .. 24's	1930-31 .. 22's	1933-34 .. 24's	1936-37 .. 27's
1927-28 .. 22's			

TABLE 7.—SPINNING TEST RESULTS FOR PUNJAB-AMERICAN 4F.

HANK (1936-37).
 Card 0-16
 Slubber 0-78
 Inter 1-68
 Rover 3-92

TRAVELLER COUNTS

20s 3/0
 24sA 4/0
 24sB 4/0

SPINDLE SPEED (1936-37).

20sB 10,175 r.p.m.
 24sA 9,500 r.p.m.
 24sB 10,600 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALISTIC.				SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%).	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).					Evenness Class.	Neps per yard.	Turns per inch Actual.
448 659	1928-29 1929-30	4-12-28 31-1-30	10 ..	.. ..	.. ..	.. ..	14 11	106 202	4.00 4.42	15.97 15.97	16.0 15.6	78.8 93.4	0.4 0.4	1,253 1,457	.. 15.9	.. 103.4	.. 3.9	.. 2,608	15.4 16.1	12.4 13.2	15.3 11.2	9.7 2.2	8.4 8.3	9.8 6.3	4 4	3.3 2.7	15.4 15.4	R4 R1	68 61	67 66
448 659	1924-28 1929-30	3-12-28 30-1-30	20A ..	.. ..	.. ..	.. ..	18 57	185 176	5.10 5.23	16.85 16.85	19.5 19.9	68.0 48.5	0.3 8.7	1,338 806	.. ..	.. ..	.. ..	.. ..	18.8 20.0	9.3 8.0	12.5 15.0	5.0 9.5	6.5 7.3	12.0 8.0	4 5	2.0 4.3	16.3 16.4	R3 R3	68 67	66 70
448 659 905 1243 1679 2180 2760 3074 3073 1 3073 2	1924-28 1924-29 1929-30 1930-31 1931-32 1932-33 1933-34 1934-35 1935-36 1936-37 1936-37	4-12-28 30-1-30 7-3-31 29-1-32 2-3-33 12-3-34 27-6-35 12-3-36 24-6-37 29-6-37	20B	7.6 8.0 9.6 7.4 7.7 8.6 7.0 7.3 7.2 9.4 0.2	8.0 10.0 11.7 8.6 9.9 9.4 9.8 12.9 10.2 14.5 14.6	0.5 0.5 0.5 0.6 0.6 0.7 0.5 0.4 0.4 0.6 0.6	15.4 18.5 20.5 15.9 17.4 17.8 17.0 19.6 17.0 22.6 22.8	12 46 52 84 70 70 65 24 42 21 16	179 188 190 194 193 195 196 198 195 209 209	5.18 5.18 5.53 5.23 5.10 5.10 5.10 5.13 5.20 5.21	17.98 17.98 17.98 17.98 17.98 17.98 17.98 17.98 17.98 17.98 17.98	10.7 10.3 10.3 10.3 10.6 10.6 10.6 10.6 10.6 10.6 10.6	74.8 62.9 60.2 72.0 80.8 80.8 80.2 84.2 84.2 88.4	5.2 10.3 5.8 6.6 4.8 4.8 4.4 4.9 4.9 5.0	1,474 1,063 1,380 1,440 1,352 1,584 1,588 1,740 1,701 1,816 1,708 19.6 20.0 19.8 19.2 20.0 19.8 20.1 20.1 19.8 117.0 123.8 141.6 156.0 152.2 162.2 143.7 164.4 173.6 4.3 3.0 4.2 4.8 4.4 4.0 4.0 5.1 5.5 2,293 2,470 2,804 2,995 3,044 3,212 2,898 3,304 3,437	20.2 20.0 20.2 20.4 20.5 20.6 20.8 20.8 20.8 20.1 20.2	10.0 8.9 9.9 9.7 10.2 11.8 11.8 11.4 12.4 12.4 12.2	11.8 13.8 10.6 15.2 11.9 18.5 18.5 18.0 12.4 10.0 10.3	4.0 8.5 8.7 9.0 6.7 5.8 5.8 5.8 5.8 4.5 1.0	6.6 7.0 7.8 6.6 8.9 8.8 7.8 7.6 7.0 8.3 8.4	12.8 10.3 9.7 9.7 7.8 8.8 8.7 10.0 8.2 7.6 8.4	4 5 4 3 3 4 4 4 4 4 4	1.8 4.0 2.8 1.1 0.8 1.2 2.1 1.4 2.0 2.2	17.4 17.4 17.2 17.2 17.2 17.4 17.2 17.4 17.1 17.1 17.2	R4 R3 R4 R0 R3 R1 R2 R3 R4 R0 R6	68 61 69 66 64 64 68 68 68 68 68	67 66 66 72 73 70 72 77 68 68 78	
340 905 1243 1679 2180 2760 3074 3073 1 3073 2	1927-28 1930-31 1931-32 1932-33 1933-34 1934-35 1935-36 1936-37 1936-37	6-1-28 7-3-31 30-1-32 2-3-33 13-3-34 27-6-35 12-3-36 24-6-37 29-6-37	24A .. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. .. ..	32 50 53 82 68 12 46 27 23	176 177 174 173 172 172 172 175 175	6.81 6.20 6.18 6.11 6.24 6.19 6.10 6.15 6.28	19.73 19.73 19.73 19.73 19.73 19.73 19.73 19.73 19.73	23.7 24.1 23.6 23.2 23.0 23.5 23.4 23.8 23.8	63.9 62.2 62.2 61.0 58.6 69.2 64.8 67.0 69.8	0.4 8.0 8.0 4.0 4.4 4.8 5.4 6.4 7.2	1,277 1,258 1,232 1,402 1,404 1,626 1,598 1,828 1,649	.. 24.1 23.9 22.8 24.2 23.6 23.6 24.7 23.9	.. 100.4 106.0 114.7 109.5 118.4 112.5 118.0 124.2	.. 2.9 3.3 3.4 2.6 3.0 3.4 3.8 4.2	.. 2,420 2,533 2,650 2,794 2,655 2,920 2,908	24.3 24.5 24.4 24.0 24.6 24.3 24.8 24.8 24.5	7.9 7.6 8.2 9.0 9.0 9.0 9.8 9.9 9.9	15.6 15.3 14.1 14.6 12.0 11.0 11.0 9.8 11.2	8.5 11.8 6.0 7.5 4.5 4.0 4.5 8.0 8.0	7.1 6.2 8.4 8.0 6.8 7.4 6.8 8.2 8.2	9.5 9.7 10.4 10.6 12.4 9.5 8.2 8.2 9.6	4 4 4 4 5 5 4 4 4	1.9 1.4 1.4 1.1 1.1 2.0 1.2 1.8 1.8	18.8 18.8 18.9 18.1 19.0 18.8 19.1 18.8 19.1	R2 R1 R0 R2 R1 R4 R2 R6 R0	69 69 66 64 64 70 68 78 79	65 69 71 64 64 70 70 68 68
895 1244 1679 2180 2760 3074 3073 1 3073 2	1930-31 1931-32 1932-33 1933-34 1934-35 1935-36 1936-37 1936-37	9-3-31 1-2-32 3-3-33 13-3-34 27-6-35 14-2-36 24-6-37 29-6-37	24B .. .. .. .. .. .. ..	.. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. ..	50 80 100 80 23 20 32 32	183 180 182 188 186 180 188 190	6.33 6.13 6.29 6.24 6.25 6.33 6.15 6.28	20.74 20.74 20.74 20.74 20.74 20.74 20.74 20.74	24.4 23.5 23.2 23.8 24.0 24.0 23.8 23.5	55.1 66.2 63.5 69.9 69.8 65.8 71.4 73.4	8.1 6.3 3.8 3.4 4.0 5.5 7.5 4.2	1,844 1,821 1,873 1,826 1,676 1,619 1,699 1,725	23.8 23.8 23.0 24.2 23.8 24.3 24.3 23.7	98.9 105.4 114.7 111.0 122.4 108.9 128.8 130.0	3.6 3.3 3.9 3.0 4.2 4.2 4.1 4.4	2,439 2,552 2,634 2,686 2,933 2,646 3,130 3,081	24.9 24.4 24.0 24.4 24.6 25.0 24.4 24.5	7.6 8.6 9.2 9.4 9.7 9.6 10.7 9.9	17.4 13.1 12.8 12.4 11.4 11.9 12.9 10.1	12.0 8.2 4.2 6.5 7.5 8.2 4.5 3.0	6.1 5.8 4.2 6.8 7.4 6.8 8.2 8.2	12.0 9.6 8.0 11.0 10.2 8.0 10.7 7.6	4 4 5 5 5 4 4 5	1.1 1.3 1.1 1.6 2.2 1.1 2.2 2.0	19.8 19.9 20.2 20.0 20.0 20.2 19.8 19.9	R1 R1 R2 R2 R4 R2 R6 R6	69 68 72 68 70 65 81 79	68 70 68 68 69 69 68 71
232 2180	1926-27 1933-34	13-5-27 19-3-34	30 30	.. ..	.. ..	.. ..	8 99	148 140	7.85 7.77	21.86 21.86	29.4 29.5	44.7 39.6	4.9 6.4	1,814 1,138	.. 30.0	.. 83.0	.. 3.4	.. 2,486	29.5 30.3	6.8 6.6	14.1 15.4	6.5 9.5	7.8 6.1	10.7 12.4	6 6	2.5 1.4	21.2 21.2	R4 R6	63 68	74 71

* Diameter of ring frame front roller— $\frac{1}{2}$ inch. Diameter of rings— $\frac{1}{16}$ inch.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	..	0.3	0.3	1.0	0.4	0	0.4	0.3	1.1	0.4	0.5	0.3	0.8
3	1.5	1.6	2.0	2.2	1.8	1.6	2.3	2.1	2.4	2.3	2.2	1.9	2.5
4	2.3	2.8	4.3	4.8	3.1	2.3	3.6	4.1	4.0	3.7	3.3	2.6	3.6
5	4.6	4.3	6.9	7.8	6.1	4.6	6.5	7.6	6.6	6.1	5.7	4.4	6.0
6	7.9	7.2	9.2	12.2	9.6	7.6	10.2	14.5	11.0	11.5	11.0	8.6	9.3
7	16.0	14.3	15.4	16.8	15.9	13.8	18.3	26.4	18.8	19.8	19.4	18.4	16.4
8	25.4	24.5	24.0	24.0	27.7	23.7	28.9	26.9	24.7	25.9	28.2	29.6	20.3
9	24.2	23.3	23.7	20.2	23.0	25.4	21.4	14.0	20.8	19.2	21.1	24.7	22.7
10	12.8	12.5	10.5	8.3	9.9	14.2	10.3	3.9	9.1	6.7	7.3	7.6	8.7
11	4.1	3.8	3.4	2.5	2.5	5.5	3.0	0.2	2.0	2.4	1.3	1.9	2.6
12	1.2	0.5	0.3	0.2	..	1.8	0.1	..	..	..	..	..	1.1
2. Fibre-Length (inch) :—													
(a) By Balls Sorter ..	1.01	1.00	0.96	0.93	0.97	1.01	0.95	0.89	0.94	0.94	0.94	0.97	0.96
(b) By Baer Sorter ..	1.02	1.00	0.98	0.95	0.96	0.99	0.97	0.90	0.96	0.94	0.95	0.97	0.95
3. Fibre-Length Irregularity (%)													
(a) By Balls Sorter ..	..	..	..	..	..	16.9	20.1	17.3	22.0	19.4	19.4	16.1	20.7
(b) By Baer Sorter ..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Fibre-Weight per inch (millionth of an ounce)													
(a) By Balls Sorter ..	0.125	0.125	0.098	0.142	0.122	0.142	0.142	0.122	0.114	0.119	0.120	0.152	0.124
(b) By Baer Sorter ..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Fibre-Strength (oz.) :—													
(a) By Balls Tester ..	..	..	0.120	0.124	0.148	0.149	0.132	0.123	0.123	0.093	0.115	0.158	0.142
(b) By O'Neill Tester ..	..	..	0.098	0.146	0.155	0.148	0.145	0.126	0.132	0.103	0.125	0.178	0.138
6. Fibre-Strength per unit fibre-weight per inch..													
(a) By Balls Tester ..	..	..	1.11	0.95	1.24	1.05	0.98	1.02	1.12	0.82	1.00	1.11	1.13
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
7. Fibre-Rigidity (millionth of an ounce, square-inch)													
(a) By Balls Tester ..	..	..	0.053	0.092	0.093	0.101	0.129	0.078	0.080	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch) ..													
(a) By Balls Tester ..	0.69	0.68	0.62	0.62	0.58	0.61	0.62	0.59	0.60	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
9. Convolutions per inch													
(a) By Balls Tester ..	122	125	88	118	122	145	130	119	118	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
10. Maturity Test Results (%)—													
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	54	59	38
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	20	26	23
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	26	15	34

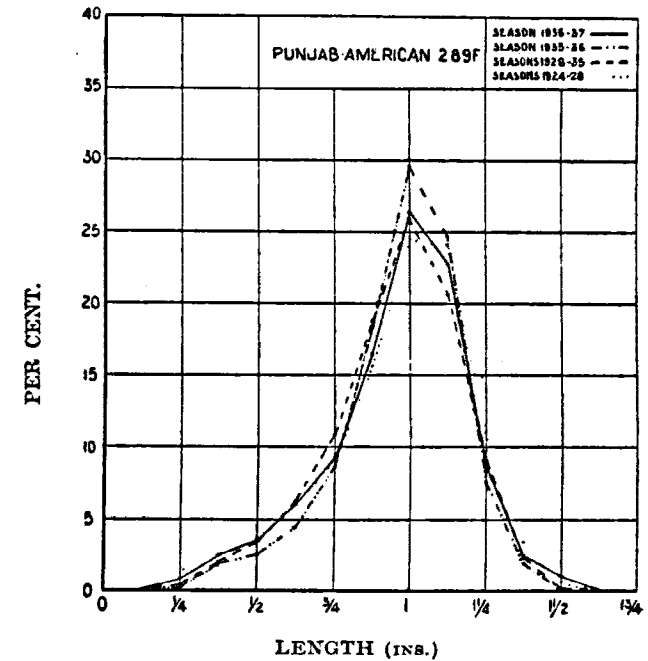


FIG. 8.—Sorter Diagrams for Punjab-American 289 F.

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1934-35 (inclusive):—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). 1935-36 and 1936-37: Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive): Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37: Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy.	Creamy-white; bright.	Creamy-white; bright.	Creamy; fairly bright.	White to creamy-white.	White to creamy-white; bright.	White to creamy-white.	White.	White; bright.	White to creamy-white; brightish.	White.
Cleanliness	Very leafy.	Fairly clean.	Clean.	Fairly clean.	A little leafy.	A little leafy.	Somewhat leafy.	Fairly leafy.	Fairly leafy.	Fairly clean.	Not clean, contains leaf & dust.
Feel .. ..	..	Nice soft.	Good silky.	Good soft.	Good silky.	Silky.	Good soft	Good soft smooth.	Good.	Good smooth.	Good soft.
Ginning and nep- piness.	Nepped & knotted in ginning.	Well-ginned except for a little knot.	Well-ginned.	Seeds cut, lint knotted and nepped.	Well-ginned.	Knotted and nepped.	Well-ginned.	Well-ginned.	Nepped & knotted.	A little knotted.	Well-ginned.
Seeds	Cut, ginned and undeveloped seeds.	..	..	..	..	..	..	..	Contains a good amount of undeveloped seeds	Contains 2% undeveloped seeds.	..
Lap	A little too leafy and knotty.	..	..	..	..	..	..	..	..	..	..
Card silver .. ..	..	..	..	..	Clean.	Clean.	Almost clean.	Clean; soft and silky.	Clean; soft	Clean.	Soft: contains a trifle leaf.
Card web	Very neppy.	..	..	..	First class.	Fairly neppy and cloudy.	Somewhat neppy.	Even; almost nepp-free.	Neppy.	A little neppy and cloudy.	A little cloudy and neppy.
Weight of 10 flat strips.	..	..	..	..	Light; 14.8 grams.	23.5 grams.	19.0 grams.	18.4 grams.	21.1 grams	17.8 grams	18.1 grams.
Remarks	Stained; a poor sample.	A very desirable cotton.	Strong fibre; a good sample.	Strong, fine regular staple; a very desirable cotton.	Fully pressed; very desirable sample.	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 8 on page 44.

Card Production for Sample No. 80 :—11.9 lb. per hour.

Ring Frame Production for 40's, Sample 80:—2.42 oz. per spindle per 10 hours.

V. REMARKS.

(i) *Fibre*.—The seasonal variation in the fibre properties of this cotton though generally small may occasionally assume quite large values. The fibre-length is much below the average in 1931-32. The fibre-weight per inch is very low in 1926-27, but high in the two seasons, 1929-31, and again in 1935-36. The fibre-strength is high in 1928-29, 1929-30 and 1935-36, but unusually low in 1933-34 when the fibre-strength per unit fibre-weight per inch assumed the lowest value hitherto recorded. The 1936-37 cotton has practically the same mean length as its predecessor, but is more irregular in length. Its fibre is also weaker but finer and it contains a much higher percentage of immature hairs.

(ii) *Waste*.—The losses in the blow-room and the card are, on the whole, rather high for this cotton, being especially so in the last two seasons.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few in 20's and 30's counts, but fairly numerous in 40's count.

(iv) *Yarns*.—This cotton usually gives even to fairly even 30's and fairly even to uneven 40's. With few exceptions its yarns are either neppy or very neppy, though in 1930-31, 1933-34 and 1935-36 they are very much better than usual. Since 1926-27 the yarn strength results are decidedly better than in the two previous seasons.

(v) *Conclusions*.—Except for the neppiness of its yarns, this cotton has generally given very good results among the Standard Indian cottons. It shows a bad throw-back in the current year as compared with last year as regards neppiness. The following are the highest standard warp counts for which the cotton is suitable in the different seasons :—

1924-25 ..	34's.	1929-30 ..	42's.	1934-35 ..	44's.
1925-26 ..	32's.	1930-31 ..	44's.	1935-36 ..	45's.
1926-27 ..	40's.	1931-32 ..	39's.	1936-37 ..	44's.
1927-28 ..	42's.	1932-33 ..	44's.		
1928-29 ..	39's.	1933-34 ..	45's.		

TABLE 8.—SPINNING TEST RESULTS FOR PUNJAB-AMERICAN 289 F.

HANK (1936-37).

Card 0.16
 Slubber 0.70
 Inter 1.69
 Rover 4.84

TRAVELLER COUNTS.

20s A 3/0
 20s B 3/0
 30s 7/0
 40s A 12/0

SPINDLE SPEED (1936-37).

20A 9,100 r. p. m.
 20B 9,975 r. p. m.
 30 10,050 r. p. m.
 40A 10,125 r. p. m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS*				YARN TEST RESULTS.											TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)								
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed E. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.					Spinning Room.	Spinning Room.	Testing Room.						
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)					Weakness Percentage.	Extension (%)	Extension Irregularity (%)	Evenness Class.	Neps per yard.	Turns per inch Actual.
449	1924-28	5-12-28	20A	9.6	10.2	0.4	19.1	12	186	4.64	16.85	19.9	96.1	7.7	1,912	..	..	..	19.7	13.4	9.3	2.1	6.5	8.5	2	11.7	16.4	84	67	68
660	1924-29	5-12-28	..	10.3	13.4	0.2	23.0	7	183	4.49	16.85	20.6	89.3	9.0	1,839	..	..	..	20.0	12.9	11.5	3.7	6.9	8.5	2	16.4	16.2	84	66	68
994	1930-31	5- 3-31	..	7.5	11.7	0.3	17.9	8	190	4.70	16.85	20.3	109.2	7.0	1,839	16.5	156.0	3.9	2,042	19.7	14.2	3.0	6.7	8.5	3	5.3	16.2	82	61	68		
2103	1933-34	25- 1-34	..	9.4	10.3	0.3	21.3	42	195	4.50	16.85	19.9	111.5	3.4	2,219	20.0	155.2	4.0	3,011	20.6	14.0	3.4	6.8	8.5	3	5.3	16.2	82	68	68		
2925	1934-35	21- 1-35	..	10.0	12.7	0.5	19.6	16	195	4.49	16.85	20.3	109.2	3.6	2,206	20.4	155.2	4.4	3,704	20.4	15.1	3.2	7.7	8.9	3	5.2	16.3	81	64	71		
2985	1935-36	7-12-35	..	10.0	12.3	0.2	21.2	16	193	4.40	16.85	19.7	117.3	3.9	2,311	19.8	178.3	4.0	3,570	21.2	14.8	3.0	7.7	7.9	3	5.2	16.3	80	66	68		
3460/1	1936-37	14- 1-37	..	9.8	10.4	0.4	19.5	21	194	4.40	16.85	20.6	106.9	6.4	2,202	20.0	160.8	3.7	3,540	20.1	15.3	1.5	7.4	8.0	3	6.5	16.6	81	68	74		
3460/2	1936-37	14- 1-37	..	9.1	11.0	0.4	19.4	0	193	4.58	16.85	20.6	102.6	4.1	2,114	20.6	155.8	4.2	3,336	20.8	13.8	1.0	6.9	5.5	4	6.5	16.6	80	60	69		
660	1929-30	31- 1-30	20B	..	..	..	..	12	189	4.94	17.98	20.0	106.4	5.2	2,128	20.1	151.8	4.1	3,051	20.4	14.0	1.2	6.7	8.5	3	5.7	17.5	82	64	67
994	1930-31	5- 3-31	..	..	..	..	..	8	198	4.60	17.98	20.0	112.2	3.9	2,244	20.2	161.5	3.8	3,262	20.3	15.0	2.5	7.0	6.7	3	2.6	17.1	80	67	70
1239	1931-32	21- 1-32	..	11.0	13.2	0.6	23.2	0	195	4.60	17.98	20.4	101.2	5.4	2,064	20.2	165.2	4.8	3,337	21.1	12.6	1.8	7.1	8.3	3	8.4	17.2	81	63	65		
1580	1932-33	13-12-32	..	10.1	11.5	0.6	20.9	42	197	4.52	17.98	20.1	114.7	3.7	2,305	20.0	189.7	3.2	3,794	20.7	15.4	1.8	7.4	8.6	3	7.1	17.5	81	64	73		
2103	1933-34	25- 1-34	..	..	..	..	..	26	197	4.50	17.98	19.4	117.6	3.4	2,241	19.9	196.9	3.4	3,918	20.4	15.8	1.2	7.9	6.6	2	2.9	17.3	80	67	74
2925	1934-35	19- 1-35	..	..	..	..	..	16	202	4.49	17.98	20.2	112.2	3.8	2,266	20.1	186.0	3.4	3,739	21.8	15.0	0.5	7.8	7.8	3	4.4	17.2	80	65	70
2985	1935-36	10-12-35	..	..	..	..	..	5	204	4.40	17.98	19.8	120.1	3.9	2,378	20.1	173.6	4.7	3,489	21.0	15.2	1.0	7.3	8.7	3	3.8	17.4	81	67	73
3460/1	1936-37	14- 1-37	..	..	..	..	..	31	200	4.53	17.98	19.9	114.8	3.7	2,285	19.8	186.0	4.0	3,683	21.0	14.4	1.0	7.0	6.0	4	6.0	17.7	79	67	79
3460/2	1936-37	14- 1-37	..	..	..	..	..	10	200	4.43	17.98	19.8	113.3	3.8	2,243	19.7	182.0	4.8	3,585	20.5	14.4	0.1	7.4	7.6	4	5.8	17.6	79	65	69
449	1924-28	6-12-28	30	..	..	..	..	8	140	6.90	21.86	29.6	55.2	9.3	1,634	..	..	..	30.1	8.5	12.1	6.0	5.7	10.5	4	10.4	21.4	84	67	66
660	1924-29	1- 2-30	..	..	..	..	..	10	159	6.50	21.86	30.2	58.8	4.5	1,776	..	..	..	29.3	8.4	11.4	4.0	6.3	9.6	5	15.3	20.9	83	67	70
994	1930-31	5- 3-31	8	159	7.15	21.86	28.9	63.3	6.2	1,829	29.2	58.6	4.9	2,587	29.4	9.0	12.2	4.5	5.9	10.8	4	3.1	21.1	80	61	66	
1239	1931-32	22- 1-32	13	163	6.98	21.86	31.2	58.4	5.5	1,822	31.8	86.0	3.9	2,735	31.1	8.7	11.3	2.5	6.2	9.6	4	6.7	20.8	81	68	69	
1580	1932-33	13-12-32	33	160	6.83	21.86	30.6	57.4	4.5	1,766	30.2	96.3	3.2	2,908	31.4	7.7	11.5	4.2	6.6	9.5	4	9.0	21.1	82	64	66	
2103	1933-34	25- 1-34	32	162	6.71	21.86	29.8	65.9	4.5	1,964	29.8	102.1	3.0	3,043	30.8	9.6	14.2	6.0	6.8	12.0	4	8.4	21.4	82	66	72	
2925	1934-35	26- 1-34	20	164	6.67	21.86	30.2	66.4	4.5	2,005	30.7	102.9	2.4	3,159	30.4	9.8	9.4	2.2	7.1	8.8	4	2.4	21.2	80	67	71	
2985	1935-36	18- 1-35	15	164	6.45	21.86	30.1	65.8	4.5	1,981	29.6	106.7	2.8	3,154	30.5	9.6	9.8	2.2	6.8	8.6	4	4.6	21.2	77	63	68	
3460/1	1936-37	20- 1-37	13	166	6.67	21.86	31.0	63.7	4.5	1,975	31.1	96.8	2.0	3,010	31.8	8.3	11.7	3.0	5.9	8.1	4	0.5	21.6	82	68	72	
3460/2	1936-37	19- 1-37	10	168	6.67	21.86	30.2	68.0	4.9	2,064	28.9	102.4	1.8	2,959	31.0	8.9	12.2	4.0	6.2	8.2	4	6.8	21.4	80	62	64	
449	1924-28	6-12-28	40A	24	137	8.98	25.28	40.3	38.0	6.4	1,531	40.2	73.0	3.8	2,935	41.6	5.2	18.5	7.2	6.0	12.2	6	10.0	24.4	82	67	67	
660	1924-29	14-12-32	42	140	8.91	25.28	40.6	41.4	6.0	1,677	39.4	75.2	3.5	2,963	40.6	6.5	13.8	6.2	6.0	11.1	6	8.5	24.4	82	68	70	
994	1930-31	24- 1-34	29	139	8.75	25.28	39.6	45.6	4.8	1,800	39.8	79.1	2.7	3,148	41.0	6.0	12.5	5.0	6.4	11.6	5	8.0	24.4	81	65	71	
1239	1931-32	19- 1-35	29	141	8.62	25.28	40.1	43.6	4.4	1,748	39.4	79.3	2.6	3,144	42.3	6.4	13.6	4.5	5.8	12.2	5	5.1	24.4	79	64	69	
2925	1934-35	10-12-35	12	135	8.53	25.28	39.8	45.6	6.3	1,788	39.1	77.8	3.7	3,042	40.3	6.4	11.3	5.0	5.2	12.1	5	1.0	25.0	82	64	70	
3460/1	1936-37	20- 1-37	10	144	8.67	25.28	39.4	44.3	5.9	1,745	38.1	78.6	2.5	2,995	39.7	6.6	11.2	2.0	5.7	10.2	6	5.2	24.4	80	64	64	
3460/2	1936-37	21- 1-37	17	145	8.79	25.28	40.1	43.1	5.0	1,728	40.7	77.6	3.0	3,158	40.5	6.2	11.4	2.5	5.7	11.4	6	6.8	24.2	81	63	68	
449	1924-28	6-12-28	40B	..	..	..	..	9	124	9.11	26.97	38.8	38.0	9.2	1,474	..	..	..	39.7	6.3	13.5	8.7	5.2	12.5	6	9.6	25.9	84	66	65
660	1924-29	8- 2-30	..	..	..	..	..	21	131	8.75	26.97	40.3	38.0	4.7	1,531	..	..	..	39.1	6.0	14.3	8.7	5.6	12.2	7	14.1	25.8	84	65	68
994	1930-31	6- 3-31	12	134	9.55	26.97	39.3	41.7	5.9	1,639	39.1	80.8	5.4	2,377	40.9	5.9	13.8	6.5	5.2	12.3	5	7.2	25.9	82	63	64	
994	1930-31	6- 3-31	..	..	..	..	..	22	139	9.11	26.97	40.1	42.4	4.4	1,709	40														

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.											
	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	1.2	1.4	..	1.3	0.9	1.1	0.9	1.1	1.6	1.2	1.0	1.5
3	2.4	2.9	2.6	3.0	2.4	3.7	3.2	2.8	3.9	2.8	2.7	3.9
4	6.5	11.1	7.3	9.5	8.8	11.4	11.1	6.1	12.6	9.2	7.9	10.3
5	23.3	34.9	24.1	27.0	31.7	34.5	35.0	22.4	32.2	26.2	21.3	25.4
6	46.0	38.8	39.2	41.5	40.4	34.0	34.8	38.1	32.5	37.3	35.6	34.2
7	15.4	8.9	21.6	12.7	13.0	11.2	10.8	22.2	12.4	17.6	21.5	16.3
8	4.4	2.0	4.8	3.5	3.4	3.6	3.4	6.8	4.0	5.1	7.5	5.7
9	0.8	..	0.4	0.3	..	0.5	0.8	0.5	0.5	0.6	2.2	2.4
10	..	..	..	..	..	..	..	..	0.3	..	0.3	0.3
2. Fibre-Length (inch) :—												
(a) By Balls Sorter ..	0.72	0.68	0.73	0.70	0.70	0.68	0.69	0.74	0.68	0.71	0.74	0.72
(b) By Baor Sorter ..	0.71	0.69	0.73	0.68	0.68	0.70	0.70	0.73	0.69	0.73	0.76	0.71
3. Fibre-Length Irregularity (%) ..	..	..	..	..	9.8	11.9	11.0	11.5	13.6	12.6	12.2	14.4
4. Fibre-Weight per inch (millionth of an ounce) ..	0.321	0.272	0.335	0.303	0.272	0.287	0.242	0.274	0.282	0.268	0.264	0.309
5. Fibre-Strength (oz.) :—												
(a) By Balls Tester ..	..	0.167	0.205	0.182	0.173	0.168	0.197	0.169	0.181	0.181	0.177	0.155
(b) By O'Neill Tester ..	..	0.162	0.186	0.182	0.161	0.172	0.179	0.175	0.200	0.199	0.196	0.168
6. Fibre-Strength per unit fibre-weight per inch ..	..	0.60	0.58	0.60	0.61	0.59	0.78	0.63	0.68	0.71	0.71	0.52
7. Fibre-Rigidity (millionth of an ounce, square-inch) ..	..	0.242	0.463	0.512	0.386	0.420	0.354	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch) ..	0.70	0.77	0.89	0.76	0.81	0.76	0.72	0.78	..	..	..	..
9. Convolutions per inch ..	76	65	114	106	87	90	78	86	..	..	..	..
10. Maturity Test Results (%) :—												
(a) Mature ..	..	..	..	..	..	..	..	..	..	73	72	80
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	21	21	13
(c) Immature ..	..	..	..	..	..	..	..	..	..	6	7	7

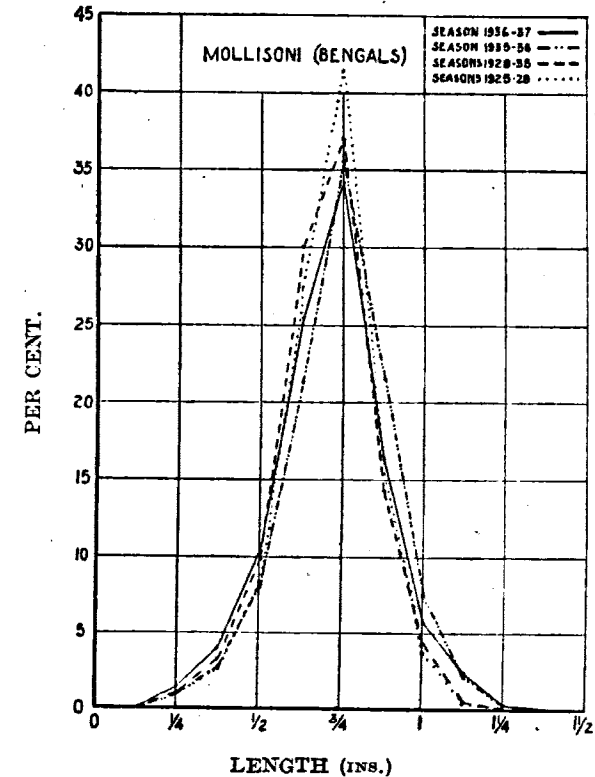


Fig. 9.—Sorter Diagrams for Mollisoni (Bengals).

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1934-35 (inclusive):—Lattice Feeder, Crighton (once), Hopper, Scutcher (3 times). The 1928-29 and 1930-31 to 1934-35 samples were passed twice through the Crighton. The 1926-27, 1927-28 and 1928-29 samples were passed twice through the Scutcher. 1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3, which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour ..	White.	Creamy-white.	White.	White to creamy-white; bright.	White.	White; bright.	White; bright.	White to creamy-white.	White to creamy-white.	White to creamy-white.	White.	White to creamy-white.
Cleanliness ..	A little leafy.	A trifle stained; leafy.	Clean.	Clean.	Fairly clean.	Fairly clean.	Fairly clean.	Fairly clean.	Fairly clean.	Fairly clean.	Clean.	Clean.
Feel ..	Harsh.	..	Harsh.	Roughish.	Harsh.	Good.	Slightly rough.	Rough.	Roughish.	Roughish.	Roughish.	Fairly rough.
Ginning and nep- piness.	..	..	Well-ginned.	Well-ginned.	Well-ginned.	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds ..	..	A few undeveloped; seedy; 0.51 per cent. mostly full ginned.	..	..	..	..	..	..	..	..	..	..
Card silver ..	..	..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean.
Card web ..	..	..	..	..	..	..	Nep-free and almost even.	Good.	Even and nep-free.	Even and nep-free.	Good.	Good.
Weight of 10 flat strips.	..	..	..	..	..	..	14.9 grams.	12.3 grams.	14.2 grams.	14.7 grams.	13.2 grams.	15.6 grams.
Remarks ..	..	Shed excessive fly in the Blow Room and at the Card.	..	Very good sample of its class.	..	Very good sample of its class.	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 9, page 48.

V.—REMARKS.

(i) *Fibre*.—The mean fibre-length of this cotton is generally about 0.70", though in some seasons, notably 1932-33 and 1935-36, it is higher than the average. The fibre-weight per inch is more variable; 1925-26, 1927-28 and 1936-37 gave high values while 1931-32 yielded a low value. Fibre-length irregularity has shown a tendency to increase and is highest in 1936-37. Fibre-strength is also variable to some extent, but fibre-strength per unit fibre-weight per inch shows fair consistency except in 1931-32 and 1936-37 being exceptionally high in the former and very low in the latter season. Fibre rigidity, ribbon-width and convolutions per inch show fair amount of seasonal variation. The 1936-37 cotton is somewhat shorter, more irregular, coarser and weaker than its immediate predecessor, though it contains a slightly higher percentage of mature fibres.

(ii) *Waste*.—This cotton has generally been delivered in a fairly clean condition and has given a loss of 5-7 per cent. in the blow-room, but the 1931-32 sample was a particularly wasteful one. The card-room loss is usually 8-9 per cent., though it has been higher than usual since 1933-34.

(iii) *Breakages*.—Yarn breakages in the ring frame have been fairly numerous even in 8's counts since 1929-30, which may partly be due to the employment of higher speeds. In 10's counts, with moderate twist, this cotton usually gives fairly numerous breakages, though in the two seasons, 1933-35, it gave many more breakages than usual.

(iv) *Yarns*.—Yarns spun from this cotton vary considerably in evenness, 8'sA yarns being fairly even to uneven in 1925-26, fairly even in 1926-27 and even in 1927-28. Since 1931-32 their degree of evenness has shown an improvement. Its yarns are practically free of neps. The best results were obtained in 1932-33 and the next best in 1934-35; since the latter season, there has been a falling off in its spinning quality.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1925-26 ..	6's.	1928-29 ..	7's.	1931-32 ..	8's.	1934-35 ..	9's.
1926-27 ..	8's.	1929-30 ..	8's.	1932-33 ..	10's.	1935-36 ..	8's.
1927-28 ..	8's.	1930-31 ..	8's.	1933-34 ..	8's.	1936-37 ..	7's.

TABLE 9.—SPINNING TEST RESULTS FOR MOLLISONI.

HANK (1936-37).

Card 0.12
 Slubber 0.54
 Inter 0.93
 Rover 1.90

TRAVELLER COUNTS

8's 7

10's 5

SPINDLE SPEED (1936-37).

8'sA 6,100 r.p.m.

8'sB 6,550 r.p.m.

10's 7,050 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)		RELATIVE HUMIDITY (%).			
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rature (inch—lbs.)	Work Irregularity (%).	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).	Extension Irregularity (%).				Evenness Class.	Neps per yard.	Turns per inch. Actual.
450	1928-29	8-12-28	6	..	..	..	..	41	191	4.12	9.87	6.0	97.6	11.4	586	..	..	..	..	6.4	14.4	19.2	15.0	9.6	10.1	5	1.6	9.5	84	66	67
450	1925-28	7-12-28	8A	..	..	..	..	7	180	5.21	11.31	8.0	69.3	7.3	554	..	..	..	..	7.7	12.7	15.5	9.8	9.4	10.0	5	0.7	11.1	86	68	71
1581	1932-33	14-12-32	8A	..	..	..	..	44	207	4.60	11.31	7.9	109.6	9.4	866	7.7	339.0	2.6	2,610	7.6	18.5	13.1	8.8	11.5	6.2	3	0.4	11.0	82	66	72
2104	1933-34	30-1-34	8A	..	..	..	..	71	206	4.40	11.31	8.0	79.6	10.5	637	7.8	292.4	4.6	2,281	8.1	14.0	16.0	11.8	10.8	9.3	3	0.4	11.0	83	66	72
2626	1934-35	21-1-35	8A	..	..	..	..	33	204	4.55	11.31	8.1	95.3	9.0	772	7.9	307.4	3.1	2,423	8.1	16.3	13.0	5.5	10.2	7.8	3	0.4	11.0	80	66	71
3092	1935-36	26-2-36	8A	..	..	..	..	28	202	4.55	11.81	8.2	80.4	9.8	708	8.1	330.0	3.6	2,673	8.2	14.4	15.0	9.8	10.4	10.1	4	0.5	10.9	80	67	68
3423/1	1936-37	19-11-36	8A	..	..	..	..	11	202	4.76	11.31	8.3	75.9	7.8	630	8.3	259.2	3.6	2,151	8.7	10.9	18.5	14.5	9.2	10.8	3	0.2	10.7	87	73	67
3423/2	1936-37	19-11-36	8A	..	..	..	..	0	202	4.76	11.31	8.2	69.8	11.6	572	8.4	244.0	5.6	2,050	8.5	12.6	16.9	10.5	8.7	10.7	3	0.5	10.8	87	73	67
450	1925-28	7-12-28	8B	5.4	7.5	0.6	13.0	12	186	5.14	12.07	7.9	96.5	8.4	762	..	..	..	..	7.9	14.0	17.7	12.0	9.7	10.2	5	1.0	11.8	85	64	72
643	1929-30	10-1-30	8B	5.1	9.0	0.8	14.0	5	182	5.41	12.07	7.7	79.0	9.0	608	..	..	..	..	7.9	14.2	16.2	10.0	10.3	9.1	5	1.6	12.0	84	67	68
996	1930-31	9-3-31	8B	7.8	9.2	0.5	16.8	27	195	4.42	12.07	7.8	93.4	7.2	725	7.9	258.4	3.8	2,041	8.1	14.6	15.8	11.2	9.7	8.6	5	1.2	11.6	84	68	65
1240	1931-32	26-1-32	8B	6.8	7.8	0.6	14.6	27	200	4.44	12.07	8.2	106.4	6.4	872	8.2	257.0	4.2	2,107	8.2	16.0	15.2	9.8	10.2	8.8	3	0.8	11.4	82	69	67
1581	1932-33	14-12-32	8B	10.8	11.8	0.6	21.4	16	196	4.50	12.07	8.0	104.4	6.4	835	8.0	277.6	2.8	2,221	8.2	15.6	15.5	11.5	9.8	8.8	4	0.6	11.6	80	68	68
2104	1933-34	30-1-34	8B	7.0	9.9	0.6	16.6	33	204	4.64	12.07	8.1	124.0	5.4	1,004	8.1	313.8	3.4	2,542	8.2	18.8	12.1	4.8	11.2	8.4	4	0.6	11.7	82	67	78
2626	1934-35	21-1-35	8B	6.9	11.4	0.5	17.9	33	204	4.46	12.07	8.1	98.8	7.6	800	8.0	298.6	3.4	2,389	8.3	15.6	14.6	7.5	11.0	9.3	3	0.4	11.8	82	67	70
3092	1935-36	26-2-36	8B	7.8	12.8	0.4	19.9	32	210	4.60	12.07	8.0	117.0	6.8	936	7.8	320.0	3.2	2,543	8.1	18.4	11.1	8.0	10.7	7.8	3	0.4	11.8	80	66	70
3423/1	1936-37	19-11-36	8B	5.6	10.4	0.2	15.6	22	204	4.65	12.07	8.3	106.6	7.0	885	8.2	335.8	3.0	2,754	8.4	16.4	13.4	6.2	10.4	7.8	4	0.8	11.7	81	70	67
3423/2	1936-37	19-11-36	8B	6.2	11.3	0.3	17.1	44	202	4.76	12.07	8.3	97.8	7.3	812	8.3	313.6	4.2	2,693	8.3	14.4	13.7	7.0	10.1	5.4	4	0.5	11.5	87	78	69
3423/2	1936-37	19-11-36	8B	5.8	12.2	0.2	17.4	22	202	4.70	12.07	8.3	93.5	7.2	776	8.3	291.6	4.5	2,420	8.3	15.0	13.9	6.5	9.4	8.4	3	0.2	11.5	87	73	69
643	1929-30	10-1-30	10	..	..	..	..	85	179	7.08	13.58	9.9	68.9	6.9	682	..	..	..	..	10.1	11.3	14.6	7.0	8.4	11.8	5	1.6	13.2	81	66	68
996	1930-31	9-3-31	10	..	..	..	..	70	178	5.59	13.58	9.7	62.8	8.6	609	10.0	187.0	4.6	1,670	10.1	11.4	20.3	15.2	10.0	11.7	6	1.0	13.1	83	67	64
1240	1931-32	26-1-32	10	..	..	..	..	25	185	5.48	13.58	9.9	71.9	9.8	712	10.0	107.8	3.5	1,978	10.0	13.4	14.4	8.2	19.0	8.6	4	1.2	13.0	83	65	66
1581	1932-33	15-12-32	10	..	..	..	..	50	180	5.66	13.58	10.0	67.0	8.4	670	10.2	184.2	2.7	1,679	10.5	10.6	18.8	12.8	8.7	13.1	5	0.8	13.1	81	64	70
2104	1933-34	30-1-34	10	..	..	..	..	32	186	5.75	13.58	10.0	93.9	8.0	939	10.2	214.2	2.4	2,185	10.8	14.2	12.2	3.8	10.0	8.2	4	1.0	13.2	82	68	72
2626	1934-35	21-1-35	10	..	..	..	..	104	186	5.54	13.68	10.1	65.6	6.2	663	10.1	197.8	2.5	1,998	10.4	11.2	15.6	11.5	10.2	8.2	4	0.5	13.2	82	64	72
3092	1935-36	26-2-36	10	..	..	..	..	68	188	5.86	13.58	10.0	81.4	8.6	814	10.1	208.2	3.1	2,103	10.4	13.2	14.0	6.0	9.5	10.8	4	0.5	13.3	80	65	72
3423/1	1936-37	19-11-36	10	..	..	..	..	22	193	5.70	13.58	10.4	76.0	8.6	790	10.3	225.2	2.5	2,820	10.6	12.8	12.7	5.5	9.6	9.6	4	0.8	13.3	82	69	66
3423/2	1936-37	19-11-36	10	..	..	..	..	36	191	5.95	13.58	10.3	69.3	6.4	714	10.2	198.4	3.8	2,123	10.7	12.0	16.0	9.0	9.4	7.2	3	0.5	13.1	86	71	68
3423/2	1936-37	19-11-36	10	..	..	..	..	18	191	5.95	13.58	10.0	73.7	11.9	737	10.2	208.0	3.5	2,122	10.5	11.9	13.7	7.0	8.8	9.8	3	0.5	13.0	86	71	67

* Diameter of ring frame front roller—1". Diameter of rings—1 1/4".

10.—ALIGARH A. 19.

Seasons.

1924-25 (Sample No. 22).	1929-30 (Sample No. 693).	1933-34 (Sample No. 2185).
1925-26 (Sample No. 111).	1930-31 (Sample No. 948).	1934-35 (Sample No. 2710).
1926-27 (Sample No. 227).	1931-32 (Sample No. 1286).	1935-36 (Sample No. 3017).
1927-28 (Sample No. 352).	1932-33 (Sample No. 1657).	1936-37 (Sample No. 3484).
1928-29 (Sample No. 482).		

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum roseum*.
- (ii) *History* :—A re-selection from Aligarh White Flower, itself a selected "Roseum" type of United Provinces *desi* (Bengals) cotton, a good yielder of high ginning percentage, with kapas of good colour, but coarse and very short. Single plant selections from Aligarh White Flower were first subjected to comparative field trials in 1917; by 1921, selection A. 19 had shown its superiority over all others tried, and from then onwards it was multiplied for distribution.
- (iii) *District of growth* :—Western districts of the United Provinces. The particular samples used in these tests have been grown on the Government Farm, Aligarh, upto 1930-31. Since 1931-32, the samples were supplied from Kalai farm in Aligarh district.
- (iv) *Growing period* :—Sown in the 3rd and 4th week in May, and picked from the 3rd week in September upto the last week in November.
- (v) *Soil* :—Alluvium of the Gangetic Plain. Soil is light loam and bhur in Aligarh farm. It is clay loam and loam in the Kalai farm.
- (vi) *Rainfall* :—Variable—from 21 to 40 inches annually. In 1929-30 the crop suffered from draught, and the cotton was grown under field conditions with canal irrigation. In 1934-35, the crop suffered much owing to heavy rains during September and October, the total rainfall being 34.84"; in 1936-37 also the crop suffered much due to heavy rains in August and September 1936 and hence the outturn is very low. Total rainfall from 1-6-36 to 15-2-37: 40.54".
- (vii) *Temperature* :—Means at Aligarh: 93° F. (June); 60° F. (December).
- (viii) *Plant particulars (average values)* :—
- Bolls per plant: 25 (spacing: 18" × 18").
 - Seed per boll: 24.
 - Weight of seed: 54 milligrammes.
 - Weight of lint per seed: 34 milligrammes.
 - Ginning percentage: 38.
- (ix) *Yield of seed-cotton* :—918 lbs. per acre (average for 10 seasons, 1918-27, at Aligarh Farm). 709 lbs. per acre in 1931-32, 921 lbs. per acre in 1932-33; 560 lbs. in 1933-34 as the rain damaged the crops during September and October; 717 lbs. in 1934-35; 305 lbs. in 1936-37.
- (x) *Area under cultivation* :—
- | | | | | | | | |
|---------|----|--------|--------|---------|----|--------|---|
| 1924-25 | .. | 2,500 | acres. | 1930-31 | .. | 80,000 | acres. |
| 1925-26 | .. | 5,000 | " | 1931-32 | .. | 51,850 | " |
| 1926-27 | .. | 15,000 | " | 1932-33 | .. | 49,430 | " |
| 1927-28 | .. | 30,000 | " | 1934-35 | .. | 30,250 | " |
| 1928-29 | .. | 30,000 | " | 1935-36 | .. | 22,175 | " |
| 1929-30 | .. | 45,000 | " | 1936-37 | .. | 13,220 | " (estimated area in the western circle). |

II. GRADER'S REPORT.

	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract under valued ..	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.	Bengal.	Fully Good Bengal.	Fully Good Bengal May.
Class	Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.	Superfine.	Superfine.	Superfine.	Extra Superfine.	Superfine.
Colour	White.	White.	White.	White.	White.	White.	White.	White.	Bright white.	White; very slightly stained.
Feel .. ..	..	..	..	..	..	..	..	..	..	Roughish for U.P.
Staple Length ..	5/8 inch.	5/8 inch.	5/8 inch.	5/8 inch.	5/8 inch.	3/4 inch.	5/8 inch.	5/8 inch.	9/16 inch.	9/16 inch.
Staple Strength ..	Poor.	Good.	Good.	Fair.	Poor.	Fair.	Fair.	Good.	Fair.	Fair.
Regularity	Fair.	Good.	Fair.	Fair.	Fair.	Fair.	Barely fair.	Regular.	Regular.	Regular.
Value above or below contract rate	Rs. 50 on.	Rs. 40 on.	Rs. 40 on.	Rs. 15 on.	Rs. 25 on.	Rs. 35 on.	Rs. 20 on.	Rs. 25 on.	Rs. 30 on.	Rs. 15 on.
Basis	Rs. 310.	Rs. 275.	Rs. 190.	Rs. 130.	Rs. 180.	Rs. 141.	Rs. 132.	Rs. 133-8.	Rs. 140.	Rs. 190.
Date of Valuation ..	20-1-28.	18-3-29.	18-3-30.	7-1-31.	14-3-32.	27-2-33.	20-3-34.	11-4-35.	10-1-36.	13-3-37.
Remarks .. ..	..	..	..	..	Like Comilla cotton.	..	..	Slightly stained.	..	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.8	0.8	0.5	0.4	0.5	0.8	1.8	0.9	1.8	1.8	1.2	1.4	2.0
3	2.9	2.5	3.0	2.9	2.8	3.0	4.4	4.2	4.1	5.9	4.0	3.9	4.2
4	8.7	7.2	12.8	9.0	9.5	9.8	13.7	15.8	13.3	18.9	17.2	13.9	16.1
5	20.1	24.0	43.8	30.1	27.1	31.1	42.1	37.0	34.2	30.3	35.9	30.2	35.6
6	40.8	41.4	38.0	41.0	42.0	37.6	23.1	23.2	30.3	20.6	23.8	20.3	24.9
7	17.5	20.6	5.5	14.0	14.4	13.4	8.5	10.0	12.4	8.0	9.3	10.4	9.8
8	3.1	3.1	0.8	2.6	3.7	3.7	1.4	4.4	4.0	2.2	2.9	4.0	3.4
9	0.1	0.4	..	..	..	0.6	..	..	0.4	0.3	0.1	0.9	..
2. Fibre-Length (Inch) :—													
(a) By Balls Sorter ..	0.71	0.72	0.66	0.70	0.71	0.70	0.65	0.67	0.68	0.64	0.66	0.67	0.66
(b) By Baer Sorter ..	0.72	0.72	0.66	0.70	0.72	0.67	0.67	0.66	0.66	0.64	0.66	0.65	0.64
3. Fibre-Length Irregularity (%) ..	..	..	..	..	..	11.5	11.8	11.1	12.5	14.5	13.0	11.4	13.5
4. Fibre-Weight per inch (millionth of an ounce)	0.287	0.303	0.301	0.305	0.324	0.277	0.301	0.314	0.290	0.262	0.271	0.264	0.275
5. Fibre-Strength (oz.) :—													
(a) By Balls Tester ..	..	..	0.187	0.188	0.239	0.200	0.206	0.208	0.227	0.181	0.228	0.204	0.203
(b) By O'Neill Tester ..	..	..	0.188	0.211	0.212	0.222	0.203	0.210	0.234	0.198	0.213	0.208	0.193
6. Fibre-Strength per unit fibre-weight per inch	..	..	0.62	0.66	0.69	0.76	0.68	0.68	0.79	0.72	0.81	0.78	0.72
7. Fibre-Rigidity (millionth of an ounce, square-inch) ..	..	..	0.301	0.450	0.641	0.506	0.672	0.667	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch) ..	0.78	0.82	0.79	0.82	0.74	0.78	0.77	0.75	0.79	..	..	..	..
9. Convolutions per inch	129	97	80	72	67	74	69	68	80	..	..	..	..
10. Maturity Test Results (%) :—													
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	78	77	67
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	12	15	15
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	10	8	18

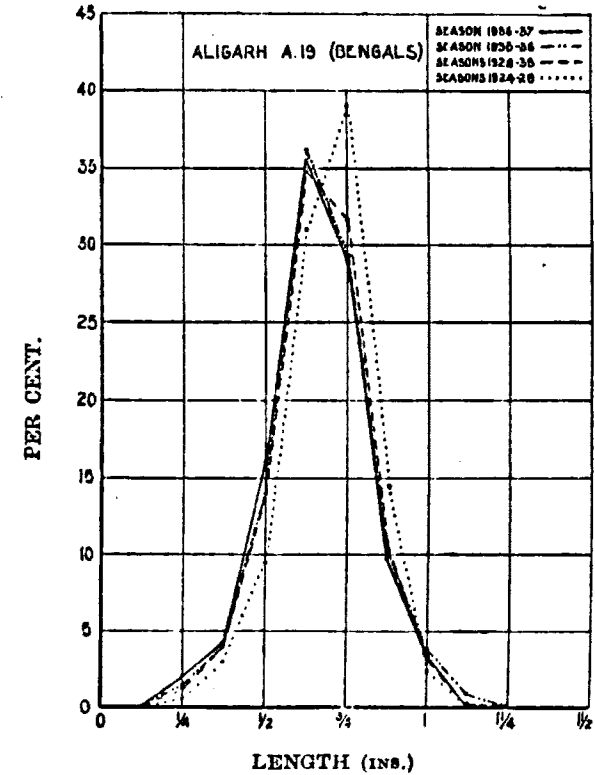


Fig. 10.—Sorter Diagrams for Aligarh A. 19—(Bengals).

IV.—SPINNING TESTS.

1. Treatment:—

(a) *Blow-room*.—1924-25, 1932-33, 1933-34 and 1934-35:—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1925-26, 1926-27, 1930-31 and 1931-32 samples were passed direct through the Crighton (once only); the 1927-28 and 1928-29 samples were passed only once through the Crighton and twice through the Scutcher, and the 1929-30 sample was passed only once through the Crighton and thrice through the Scutcher.

1935-36 and 1936-37:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37:—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report:—

Season.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White; bright.	Creamy-white to whitish.	Creamy-white.	White.	White; bright.	White.	White.	White.	White to creamy-white.	White to creamy-white.	White to creamy-white; bright.	White.
Cleanliness ..	Clean.	..	Clean.	Perfectly clean.	Perfectly clean.	Perfectly clean.	Very clean.	Somewhat leafy.	Slightly stained; fairly clean.	Occasional stain; somewhat leafy.	Fairly clean.	Fairly clean; occasional stain.
Feel .. .. .	..	Typical (harsh) feel of its class.	..	Very rough.	Good.	Typical (harsh) feel of its class.	Rough.	Roughish feel.	Roughish.	Rough.	Roughish.	Rough.
Ginning and nep- piness.	..	..	..	Well-ginned.	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds .. .. .	..	..	..	..	..	..	..	1.25 per cent. ginned and unginned	Some cut and ginned.	3/4 per cent.	..	..
Card-sliver ..	..	..	..	..	..	..	Clean.	Clean.	Clean.	Almost clean.	Clean.	Clean.
Card-web .. .	..	..	..	..	..	..	Nep-free.	Fairly even and nep-free.	Fairly even.	Even and nep-free.	Good.	Fairly good.
Weight of ten flat Strips .. .. .	..	..	..	..	..	..	12.4 grams.	18.0 grams.	14.8 grams.	16.2 grams.	11.0 grams.	14.0 grams.
Remarks	Blow-room waste practically all fibre.	0.41 per cent. web shedding; Card waste entirely fibre (fly)	Card waste is good clean fibre; a very fine sample.	..	First rate sample of its class.	..	Much fly resulted in carding.	The cotton is less clean than usual and much more seedy.	..	..	..	..

3. Spinning Test Details and Results:—See Table 10, page 52.

V.—REMARKS.

(i) *Fibre*.—Since 1930-31 this cotton has shown a falling off in its mean fibre-length, attaining its lowest recorded value in 1933-34. The fibre-weight per inch and the fibre-strength do not show much seasonal variation, though the latter is rather low in 1933-34 and 1936-37. The fibre-strength per unit fibre-weight per inch is unusually high in 1932-33, 1934-35 and 1935-36. The fibre-rigidity is extremely variable, being nearly 90 per cent. higher in 1930-32 than in 1926-27. The ribbon-width is high in 1927-28 but low in the next season, while convolutions per inch are unusually numerous in 1924-25. The 1936-37 sample contains rather more immature hairs than in the past two years.

(ii) *Waste*.—The samples of this cotton were supplied in a very clean condition upto 1931-32, but the subsequent samples are rather wastey and gave fairly high losses both in the blow-room and the card-room.

(iii) *Breakages*.—Yarn breakages in the ring frame are fairly numerous in 6's and 8's counts of practically all seasons and exceedingly numerous in 8's counts of 1931-32 and 1932-33 and in all counts of 1933-34.

(i v) *Yarns*.—Yarns spun from this cotton vary considerably in evenness with the season, the 8's yarns ranging from even to fairly even in some seasons to fairly even to uneven in others. The 6's yarns, however, are either even or even to fairly even. They are characterised by almost complete freedom from neppiness. The best yarn strength results were obtained in 1925-26 and the poorest in 1932-33 and 1933-34.

(v) *Conclusions*.—The chief fibre-properties are fairly constant, but the minor properties fluctuate considerably with the season. The yarn strength results were fairly constant till 1930-31, but since then a decline is noticeable which is very marked indeed in the three seasons 1932-35.

1924-25	..	7's.	1928-29	..	7's.	1932-33	..	6's.	} (inferior to previous seasons).
1925-26	..	8's.	1929-30	..	7's.	1933-34	..	6's.	
1926-27	..	7's.	1930-31	..	7's.	1934-35	..	6's.	
1927-28	..	7's.	1931-32	..	6's.	1935-36	..	6's.	
						1936-37	..	6's.	

TABLE 10.—SPINNING TEST RESULTS FOR ALIGARH A.10.
TRAVELLER COUNTS

SPINDLE SPEED (1936-37).

HANK (1936-37).
Card 0.13
Slubber 0.54
Inter 0.94
Rover 1.58

0s 0
8s 7

0s 5,500 r.p.m.
8sB 5,800 r.p.m.
8sC 6,675 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LBA.			BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.					
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%).	Count-work Product.	Counts.	Strength (osa.)	Strength Irregularity (%).	Weakness Percentage.					Extension (%).	Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
482	1924-29	22-2-29	8	..	..	..	..	60	188	4.04	9.87	0.0	106.0	9.6	636	..	..	..	6.1	19.0	19.7	15.0	8.7	12.3	3	1.1	9.7	84	65	66	
693	1929-30	14-8-30	..	..	..	..	..	30	195	3.80	9.87	0.0	98.6	7.1	592	6.2	270.2	5.4	1,075	6.0	18.8	20.8	17.2	10.0	10.8	4	0.8	9.6	83	65	64
948	1930-31	6-1-31	..	..	..	..	..	110	204	3.69	9.87	6.2	104.6	6.8	649	6.4	280.8	4.8	1,797	6.4	17.6	17.1	12.0	8.6	9.4	3	0.5	9.5	81	69	69
1286	1931-32	9-3-32	..	..	..	..	..	41	198	3.58	9.87	6.1	86.6	5.2	528	6.0	321.2	3.6	1,927	6.2	15.4	19.6	16.7	9.0	10.7	3	0.6	9.5	85	69	71
1657	1932-33	15-2-33	..	..	..	..	..	100	189	4.20	9.87	6.0	54.4	11.4	326	6.0	254.8	5.0	1,529	6.2	18.3	21.6	18.5	9.1	12.0	4	0.9	9.5	82	65	70
2185	1933-34	23-3-34	..	..	..	..	..	116	182	4.22	9.87	6.2	51.2	14.8	317	6.0	209.0	4.7	1,614	6.2	14.2	22.0	22.8	9.8	12.6	4	0.8	9.6	86	74	71
2710	1934-35	4-4-35	..	..	..	..	..	20	184	4.20	9.87	6.4	58.6	9.2	375	6.5	266.8	4.1	1,734	6.6	13.6	20.2	14.8	8.2	13.2	4	0.6	9.4	82	70	68
3017	1935-36	4-1-36	..	..	..	..	..	0	190	4.20	9.87	6.3	81.2	10.8	512	6.2	321.2	5.5	1,991	6.5	14.6	21.9	18.5	8.6	9.6	4	0.5	10.4	80	67	69
3484/1	1936-37	11-2-37	..	..	..	..	..	14	196	4.08	9.87	6.2	80.1	5.8	497	6.1	292.8	4.1	1,786	6.4	16.1	20.6	17.5	7.8	10.2	3	0.2	9.6	81	70	67
3484/2	1936-37	11-2-37	..	..	..	..	..	14	198	4.08	9.87	6.1	82.0	8.5	500	6.2	276.4	5.2	1,714	6.2	17.9	19.2	15.0	9.0	11.2	3	0.5	9.6	81	71	69
482	1924-29	22-2-29	8A	..	..	..	..	60	175	5.32	11.81	8.0	56.6	12.9	477	8.1	12.9	8.4	12.9	24.6	21.5	7.7	14.8	5	1.2	10.8	83	70	69		
693	1929-30	13-8-30	..	..	..	..	..	65	178	5.00	11.81	8.1	61.1	10.2	414	8.2	184.0	4.2	1,509	8.1	10.8	21.9	18.7	8.4	10.8	5	1.1	11.0	85	68	66
482	1924-29	22-2-29	8B	4.1	7.8	0.8	12.4	30	188	4.03	12.07	7.8	88.4	9.8	690	..	..	..	8.1	16.8	15.4	8.7	7.2	12.0	5	0.5	11.8	85	64	65	
693	1929-30	13-8-30	..	3.3	6.7	0.3	10.1	35	180	5.37	12.07	8.0	80.7	9.9	646	..	..	..	8.0	16.2	18.1	12.2	8.6	9.4	6	0.8	11.6	84	68	71	
948	1930-31	6-1-31	..	2.4	7.9	0.3	10.4	55	183	4.05	12.07	7.9	79.3	8.0	626	8.1	217.6	4.4	1,762	8.0	15.4	21.4	18.7	9.8	11.8	5	1.1	11.7	85	65	67	
1286	1931-32	9-3-32	..	3.6	10.0	0.6	13.8	53	180	4.70	12.07	8.1	84.6	5.8	685	8.2	236.6	3.4	1,940	8.4	15.8	15.1	14.8	8.6	11.4	4	0.6	11.6	81	68	69	
1657	1932-33	15-2-33	..	3.2	10.8	0.4	14.0	191	176	4.81	12.07	8.2	56.5	7.8	498	8.2	204.6	4.3	1,678	8.4	11.5	22.2	18.5	7.8	12.4	4	0.9	11.6	87	70	70	
2185	1933-34	23-3-34	..	9.6	12.2	0.6	21.0	174	165	5.64	12.07	8.0	44.8	10.3	358	8.0	178.0	4.0	1,424	7.8	13.6	25.8	21.8	9.2	13.6	5	0.6	11.6	82	67	69	
2710	1934-35	4-4-35	..	9.4	13.0	0.4	21.5	202	199	5.58	12.07	8.1	36.2	8.8	293	8.2	174.4	4.7	1,430	8.2	10.5	24.6	22.0	8.4	16.9	5	0.9	11.6	85	71	70	
3017	1935-36	4-1-36	..	8.1	10.1	0.4	17.6	33	180	5.46	12.07	8.4	52.2	10.0	438	8.2	217.2	3.8	1,781	8.4	12.8	21.0	19.2	8.2	11.7	4	0.9	11.6	82	69	66	
3484/1	1936-37	12-2-37	..	7.3	10.6	0.4	17.5	33	170	5.30	12.07	8.3	63.3	8.9	525	8.4	221.2	4.6	1,858	8.4	13.4	20.7	16.0	8.4	9.6	4	0.2	12.8	80	68	68	
3484/2	1936-37	11-2-37	..	8.8	11.4	0.2	19.4	11	175	5.30	12.07	8.1	70.3	8.1	509	8.3	216.8	3.4	1,799	8.4	18.9	20.5	18.5	7.4	12.3	4	0.2	11.7	80	68	68	
..	1936-37	11-2-37	..	9.1	11.1	0.2	19.4	22	178	5.30	12.07	8.4	64.9	12.8	545	8.5	204.8	4.6	1,741	8.3	15.5	18.9	13.5	8.5	10.1	4	0.2	11.6	82	72	68	
948	1930-31	6-1-31	8C	..	..	..	..	94	190	4.84	12.63	8.2	98.8	6.1	810	8.4	236.8	3.6	1,989	8.4	17.7	17.4	13.8	8.8	10.1	4	1.0	12.2	80	69	70
1286	1931-32	9-3-32	..	..	..	..	..	114	188	4.81	12.63	8.2	97.7	9.4	555	8.4	207.8	3.1	1,746	8.6	12.4	24.1	21.0	8.0	12.6	5	1.0	12.1	87	70	68
1657	1932-33	15-2-33	..	..	..	..	..	124	198	5.61	12.63	8.1	52.4	10.8	424	8.2	191.0	3.8	1,566	8.4	12.4	27.2	22.5	8.8	14.0	4	0.9	12.2	82	67	70
2185	1933-34	23-3-34	..	..	..	..	..	207	198	5.58	12.63	8.2	40.3	10.2	380	8.3	190.2	3.9	1,579	8.4	12.1	22.4	17.0	8.4	13.4	5	0.6	12.2	84	69	69
2710	1934-35	5-4-35	..	..	..	..	..	24	178	5.39	12.63	8.1	74.0	8.1	609	8.0	251.4	3.2	2,011	8.1	16.6	15.8	11.0	9.0	8.9	4	0.5	12.1	82	70	70
3017	1935-36	6-1-36	..	..	..	..	..	22	182	5.39	12.63	8.4	75.5	9.3	634	8.2	243.2	3.9	1,994	8.3	15.7	17.8	12.0	9.0	9.9	4	0.8	12.9	78	63	68
3484/1	1936-37	11-2-37	..	..	..	..	..	33	194	5.30	12.63	8.2	82.0	8.5	672	8.1	246.0	3.8	1,998	7.9	17.1	15.7	10.0	8.2	11.1	4	0.6	12.2	83	68	69
3484/2	1936-37	11-2-37	..	..	..	..	..	0	194	5.30	12.63	8.2	84.8	8.9	695	7.9	253.6	4.2	2,008	8.0	18.5	16.4	9.5	9.0	9.9	4	0.5	12.2	83	69	69
..	1936-37	..	10	..	..	..	..	50	175	5.97	12.58	9.7	55.4	9.9	537	..	..	..	10.1	12.0	18.9	13.8	6.2	15.7	7	0.5	13.2	86	65	64	

* Diameter of ring frame front roller— $\frac{1}{2}$ inch, Diameter of rings—1 inch.

11.—C. 402 (U. P.)

Seasons ..	{	1931-32 (Sample No. 1235).
		1932-33 (Sample No. 1612).
		1933-34 (Sample No. 2088).
		1934-35 (Sample No. 2643).
		1935-36 (Sample No. 3091).
		1936-37 (Sample No. 3476).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical Species*:—Hybrid (see "History" below).
- (ii) *History*:—Obtained in 1906 from a cross between *G. arboreum* (red-flowered type) and *G. neglectum roseum* (white-flowered type). In its 10th generation in 1916 the plant was again crossed by *G. ceruuum* (pale yellow-flowered type). In the season 1922-23 the cotton was styled C. 402—a yellow-flowered type.
- (iii) *District of growth*:—For several years past the strain has been given out to different centres in U. P. such as Muttra, Hardoi, Cawnpore and several other places. The 1931-33 samples used in these tests are collected from a large number of cultivators in Madhoganj (District Hardoi, U. P.), but the subsequent samples are from the Government Experimental Station, Hardoi. There is, however, practically no difference in the conditions under which cotton is grown at these two places as they are in the same tract and are similar in soil and climate and are only about 15 miles apart.
- (iv) *Growing period*:—Sown in the third week of May and picked from the first week of October upto the end of December.
- (v) *Soil*:—Alluvium of the Gangetic plain; Light loam in Hardoi.
- (vi) *Rainfall*:—Variable: about 30" annually; average of 1930-31 to 1935-36:—30.67"; 52.49" in 1936-37.
- (vii) *Temperature*:—

				Max.	Min.
Sown at	..	..	..	108° F.	80° F.
Period of growth	..	..	..	90° F.	78° F.
Picked at	..	..	..	85° F.	56° F.

(viii) *Plant particulars (average values)*:—

- (a) Bolls per plant: 28 (spacing 30" × 24").
- (b) Seeds per boll: 27.
- (c) Weight of seed: 60 milligrammes.
- (d) Weight of lint per seed: 38 milligrammes.
- (e) Ginning percentage: 39.

(ix) *Yield of seed-cotton*:—From 772 to 1,045 lbs. per acre. Average yield per acre 570 lbs. at the Government Experimental Farm, Hardoi; 650 lbs. in 1934-35; 749 lbs. in 1935-36.

(x) *Area under cultivation*:—

1,381	acres sown at Hardoi in the season	1932-33.
3,460	"	" 1933-34.
2,270	"	" 1934-35.
1,430	"	" 1935-36.
1,350	"	" 1936-37.

II.—GRADER'S REPORT.

	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under ..	Broach.	Broach.	Bengal.	Bengal.	Fully Good Bengal.	Fully Good Bengal March.
Class	Superfine.	Fine.	Extra Super-fine.	Superfine.	Superfine.	Superfine.
Colour	White.	White.	White.	White.	White.	White.
Feel .. ..	..	..	..	..	..	Silky.
Staple length	13/16".	29/32".	3/4".	11/16".	11/16".	Full 5/8".
Staple strength	Fair.	Fair.	Fair.	Fair.	Fair.	Very good.
Regularity	Fair.	Fair.	Fair.	Poor.	Regular.	Regular.
Value above or below contract rate	Rs. 30 on.	Rs. 35 on.	Rs. 25 on.	Rs. 40 on.	Rs. 10 on.	Rs. 40 on.
Basis	Rs. 210.	Rs. 203.	Rs. 141.	Rs. 150.	Rs. 143.	Rs. 178.
Date of valuation	1-2-32.	12-1-33.	24-1-34.	11-2-35.	28-2-36.	13-2-37.
Remarks .. ..	..	A nice cotton.	..	..	..	Sample hand-ginned.

III.—FIBRE PARTICULARS.

1. Fibre-length distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.					
	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.3	0.4	0.6	0.4	0.7	0.7
3	1.4	1.9	2.3	2.3	2.7	2.5
4	4.1	6.0	7.4	5.8	5.6	5.0
5	11.8	15.7	20.8	12.4	13.1	11.8
6	25.8	27.8	33.7	28.6	24.5	26.0
7	35.6	29.1	24.6	32.4	30.4	30.5
8	16.3	14.4	7.8	14.6	17.3	16.8
9	4.7	4.7	2.3	3.4	4.8	5.8
10	..	..	0.5	0.1	0.9	0.9
2. Fibre-length (inch) :—						
(a) By Balls Sorter	0.82	0.80	0.76	0.80	0.81	0.82
(b) By Baer Sorter	0.78	0.78	0.75	0.82	0.81	0.82
3. Fibre-length irregularity (%)	13.9	15.0	11.8	15.5	17.6	15.6
4. Fibre-weight per inch (millionth of an oz.)	0.204	0.195	0.181	0.164	0.184	0.168
5. Fibre-strength (oz.) :—						
(a) By Balls Tester	0.181	0.183	0.160	0.142	0.158	0.147
(b) By O'Neill Tester	0.184	0.188	0.178	0.142	0.157	0.157
6. Fibre-strength per unit fibre-weight per inch.	0.89	0.95	0.93	0.87	0.86	0.90
7. Maturity Test Results (%) :—						
(a) Mature .. .. .	..	..	..	63	63	63
(b) Half-mature .. .. .	..	..	..	21	25	15
(c) Immature .. .. .	..	..	..	16	12	22

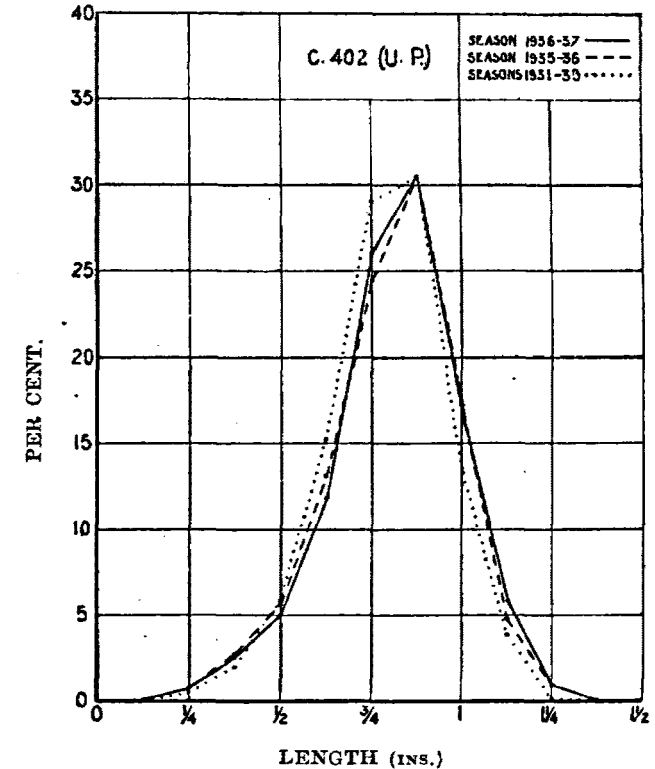


Fig. 11.—Sorter Diagrams for C. 402 (U.P.)

IV.—SPINNING TESTS.

1. *Treatment* :—

- (a) *Blow-room*.—Upto 1934-35 (inclusive) :—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). 1931-32 sample was passed only once through the Crighton. 1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).
- (b) *Card-room* :—Upto 1934-35 (inclusive) :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White.	White.	White; bright.	White; bright-ish.	White.	White.
Cleanliness	Fairly clean.	Fairly clean.	Fairly clean.	Clean.	Clean.	Fairly clean; a trifle stained.
Feel	Slightly harsh.	Good and slightly rough.	Good smooth.	Good.	Good.	Good.
Ginning and neppiness.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds .. ..	..	..	..	..	..	..
Card sliver	Clean.	Clean.	Clean.	Clean.	Clean.	Good and clean.
Card web	Even and nep-free.	Even and nep-free.	Even and nep-free.	Good.	Even and nep-free.	Good and nep-free.
Weight of 10 flat strips.	10.9 grams.	15.3 grams.	19.3 grams.	21.6 grams.	14.2 grams.	15.1 grams.
Remarks .. ..	..	..	A good sample of its class.	..	..	..

3. *Spinning Test Details and Results* :—See Table 11, page 56.

V.—REMARKS.

(i) *Fibre* :—During the two seasons, 1931-33, the fibre-properties of this cotton did not show much variation, but the 1933-34 sample was shorter and weaker, though finer and more regular than its predecessors. The 1934-35 sample shows an improvement both in length and fineness over the 1933-34 sample, being 7 per cent. longer and about 10 per cent. finer. Its fibre-strength, however, is 16 per cent. less than that of the 1933-34 sample, though its intrinsic strength is only 6 per cent. less. The improvement in fibre characters, noted in 1934-35, has been continued upto the current season.

(ii) *Waste* :—This cotton gives a blow-room loss of 7-8 per cent., but its card-room loss is rather on the high side.

(iii) *Breakages* :—Yarn breakages in the ring frame are fairly numerous or numerous in practically all counts in the previous seasons, but in 1934-35 and 1935-36 they are comparatively few.

(iv) *Yarns* :—This cotton generally gives even 16's and even to fairly even 20's. Its yarns are slightly neppy. The 1933-34 cotton yielded stronger yarns than the previous seasons' samples, while the 1936-37 cotton has given the best yarn strength results. From its yarn strength results, this cotton is adjudged suitable for spinning upto the following highest standard warp counts :—

1931-32	15's.
1932-33	14's.
1933-34	18's.
1934-35	22's.
1935-36	16's.
1936-37	23's.

TABLE 11.—SPINNING TEST RESULTS FOR C402 (U.P.)

TRAVELLER COUNTS.

SPINDLE SPEED (1936-37).

HANK (1936-37).
 Card 0.14
 Slubber.. .. . 0.60
 Inter 1.29
 Rover 3.02 ; 4.00 (2 Hanks).

16s 1/0
 20s 3/0
 24s 4/0

16s 8,350 r.p.m.
 20s 9,100 r.p.m.
 24s 9,300 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.						Spinning Room.	Spinning Room.	Testing Room.					
												Counts Actual.	Strength (lbs.)	Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch—lbs.).	Work Irregularity (%).	Count-work Product.	Counts.	Strength (ozs.).	Strength Irregularity (%).	Weakness Percentage.					Extension (%).	Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
1612	1932-33	16-1-33	14	..	..	..	..	50	202	5.39	14.98	14.4	91.2	7.4	1,813	14.0	180.2	4.8	2,523	14.6	13.8	12.0	4.2	7.6	7.6	3	1.0	14.6	81	70	70
2038	1933-34	11-1-34	14	..	..	..	..	76	204	5.21	14.98	14.2	102.9	5.8	1,461	14.1	173.7	4.2	2,449	14.4	14.6	10.2	2.0	6.8	10.0	4	0.9	14.5	79	64	71
2643	1934-35	1-2-35	14	..	..	..	..	11	206	4.94	14.98	14.3	117.5	4.9	1,680	14.0	201.4	3.4	2,820	14.4	16.2	8.6	1.0	7.7	7.2	3	1.4	14.5	80	65	68
3091	1935-36	24-2-36	14	..	..	..	..	18	203	5.35	14.98	14.0	101.4	5.8	1,420	13.9	184.4	4.8	2,563	14.0	15.2	10.4	1.5	7.2	8.6	3	1.0	14.3	80	69	68
1235	1931-32	20-1-32	16	5.3	8.4	0.6	13.5	36	200	6.07	15.97	15.8	76.2	6.5	1,204	..	..	..	..	16.6	11.7	11.5	6.0	7.2	12.1	3	1.2	15.5	79	64	70
1612	1932-33	16-1-33	16	5.4	8.9	0.4	14.2	33	195	6.10	15.97	16.2	74.4	9.2	1,205	15.9	140.2	4.0	2,229	15.9	12.7	12.0	3.8	7.4	7.1	4	1.0	15.4	80	69	72	
2038	1933-34	11-1-34	16	7.8	9.9	0.5	17.4	24	191	5.88	15.97	16.1	86.1	6.0	1,380	16.0	137.6	3.8	2,202	16.6	12.4	13.4	6.5	6.2	11.4	4	1.0	15.4	79	65	70	
2643	1934-35	31-1-35	16	7.5	11.6	0.4	18.5	9	196	5.55	15.97	16.4	102.5	5.2	1,681	16.0	163.0	3.6	2,608	16.6	14.0	11.4	1.8	7.2	7.7	3	1.8	15.3	80	66	68	
3091	1935-36	24-2-36	16	6.9	8.4	0.2	14.9	3	194	6.15	15.97	16.2	77.6	8.2	1,257	16.2	137.2	4.3	2,223	16.2	12.7	11.6	3.8	6.6	9.8	4	0.8	15.2	81	67	68	
3476/1	1936-37	8-2-37	16	6.8	8.4	0.4	14.9	6	190	5.68	15.97	16.2	103.7	4.6	1,680	15.9	167.2	5.4	2,658	16.3	14.4	10.6	1.5	6.6	8.3	3	2.2	15.1	80	64	68	
3476/2	1936-37	8-2-37	16	6.9	7.9	0.4	14.6	0	190	5.44	15.97	16.1	102.0	2.8	1,652	15.9	157.8	4.2	2,509	16.2	14.2	11.3	3.0	7.0	8.7	3	1.8	15.2	81	65	67	
1235	1931-32	23-1-32	20	..	..	..	..	104	134	5.83	17.98	19.5	57.1	7.1	1,113	..	..	..	..	20.1	9.7	12.7	5.0	6.8	10.5	4	2.0	17.3	81	67	70
1612	1932-33	16-1-33	20	..	..	..	..	120	179	6.25	17.98	20.0	59.0	9.9	1,056	19.8	107.0	3.2	2,119	20.1	9.7	12.6	5.2	6.8	11.0	5	1.8	17.4	81	69	74
2038	1933-34	10-1-34	20	..	..	..	..	68	177	5.95	17.98	20.0	62.4	7.2	1,248	19.8	106.5	3.1	2,109	20.2	9.8	10.9	3.2	5.6	9.4	5	1.2	17.4	82	65	70
2643	1934-35	1-2-35	20	..	..	..	..	12	182	5.87	17.98	20.2	74.2	5.8	1,499	20.1	118.5	3.5	2,382	20.7	10.4	9.8	3.0	6.5	8.2	4	1.8	17.3	80	66	68
3091	1935-36	22-2-36	20	..	..	..	..	3	178	6.13	17.98	20.0	58.0	7.8	1,160	19.8	109.8	3.2	2,174	20.0	10.0	13.7	3.5	6.2	11.2	4	1.1	17.2	81	66	68
3476/1	1936-37	5-2-37	20	..	..	..	..	5	188	5.53	17.98	20.5	75.7	5.1	1,652	20.5	116.6	2.5	2,390	21.6	10.3	10.0	2.0	6.0	7.1	4	1.8	17.1	81	68	69
3476/2	1936-37	6-2-37	20	..	..	..	..	21	188	5.32	17.98	20.6	69.4	7.2	1,430	20.5	109.8	2.3	2,251	21.5	9.6	12.4	5.0	6.2	8.1	4	2.0	17.1	82	69	68
3476/1	1936-37	5-2-37	24	..	..	..	..	41	165	6.38	19.73	23.9	62.2	6.4	1,487	23.7	100.6	2.6	2,384	24.2	9.0	12.0	5.0	5.8	9.5	5	2.5	18.7	83	69	67
3476/2	1936-37	6-2-37	24	..	..	..	..	32	163	6.25	19.73	23.7	66.6	6.8	1,341	23.6	95.8	2.6	2,261	24.9	8.5	14.3	5.0	5.4	8.0	5	2.0	19.2	82	68	66

* Diameter of ring frame front roller— $\frac{1}{4}$ ". Diameter of rings— $\frac{1}{16}$ ".

12 (a).—VERUM 262 (Nagpur).

Seasons ..	{	1926-27 (Sample No. 247).
		1927-28 (Sample No. 346).
		1928-29 (Sample No. 468).
		1929-30 (Sample No. 628).
		1930-31 (Sample No. 962).
		1931-32 (Sample No. 1242).
		1932-33 (Sample No. 1600).
		1933-34 (Sample No. 2112).
		1934-35 (Sample No. 2556).
		1935-36 (Sample No. 3002).
	}	1936-37 (Sample No. 3455).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum verum*.
- (ii) *History* :—A pure line strain isolated by selection in 1924, and known as strain Verum 262.
- (iii) *District of growth* :—Central Provinces and Berar. The particular samples used in these tests have been grown at the Government Experimental Farm, Nagpur.
- (iv) *Growing Period* :—June to November.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—35-40 inches.
- (vii) *Temperature* :—Maximum temperatures : June—110° F., January—85° F.
- (viii) *Plant particulars (average)* :—
- Bolls per plant : 14 (spacing 18" × 9").
 - Seeds per boll : 25.
 - Weight of seed : 54 milligrammes.
 - Weight of lint per seed : 24 milligrammes.
 - Ginning percentage : 32-33 (In bulk field samples from 32 to 35 per cent.).
- (ix) *Yield of seed-cotton* :—500 lbs. per acre (average yield). 350-750 lbs. per acre according to soil and climatic conditions.
- (x) *Area under cultivation* :—About
- | | |
|--|---|
| | 5,000 acres in 1928-29. |
| | 35,000 acres in 1929-30. |
| | 1,50,000 acres in 1930-31 (Total area). |
| | 1,64,800 acres in 1931-32 ("). |
| | 83,590 acres in 1932-33 ("). |
| | 89,560 acres in 1933-34 ("). |
| | 96,000 acres in 1934-35 ("). |
| | 78,550 acres in 1935-36 ("). |
| | 70,000 acres in 1936-37 ("). |

II. GRADER'S REPORT.

	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under..	Berar.	Broach.	Broach.	Berar.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach A/M
Class	Fine.	Superfine.	Fine.	Extra Superfine.	Fine.	Fine.	Extra Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.
Colour	White.	White.	White.	White.	White.	White.	White.	White.	White.	Bright white.	Bright white.
Staple Length	7/8 inch.	15/16 inch.	15/16 inch.	15/16 inch.	7/8 inch.	31/32 inch.	29/32 inch.	7/8 inch.	Bare 31/32 inch.	11/16 inch.	13/16 inch.
Staple Strength	Fair.	Good.	Good.	Good.	Fair.	Good.	Fair.	Fair.	Fair.	Somewhat soft and wasty.	Very good.
Regularity	Fair.	Good.	Good.	Good.	Poor.	Good.	Fair.	Fair.	Fair.	Somewhat irregular.	Regular.
Value above or below contract rate	Rs. 35 on.	Rs. 70 on.	Rs. 35 on.	Rs. 80 on.	Rs. 20 on.	Rs. 40 on.	Rs. 40 on.	Rs. 35 on.	Rs. 80 on.	Rs. 10 on.	Rs. 20 on.
Basis .. .. .	..	Rs. 370.	Rs. 355.	Rs. 270.	Rs. 200.	Rs. 210.	Rs. 208.	Rs. 215.	Rs. 220.	Rs. 210.	Rs. 228.
Date of Valuation	17-5-27.	20-1-28.	7-2-29.	18-12-29.	5-2-31.	26-1-32.	9-1-33.	7-2-34.	3-12-34.	9-1-36.	30-1-37.
Remarks	For staple.	..	..	..	..	..	..	..	..	..	Silky; desirable cotton.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.										
	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
	2	..	0.2	..	0.4	0.3	..	0.2	0.9	1.2	1.7	0.7
3	1.7	1.4	1.5	1.8	1.7	1.9	2.0	2.8	2.3	2.6	2.1
4	3.3	3.3	3.8	3.8	8.9	4.8	4.6	5.3	4.7	5.5	5.4
5	8.1	7.4	7.5	10.2	9.4	11.8	10.5	19.9	12.0	10.2	14.2
6	22.6	15.7	19.5	23.1	25.6	25.4	23.7	31.7	24.7	21.0	30.0
7	41.0	32.6	34.5	35.3	37.1	36.2	33.7	33.2	30.5	29.9	28.2
8	18.9	28.5	24.8	16.0	16.4	16.0	19.2	9.8	16.6	21.1	14.7
9	4.4	9.1	6.8	4.2	4.8	3.9	5.4	1.8	6.4	6.5	4.0
10	..	1.8	1.6	0.2	0.7	..	0.7	0.4	1.6	1.5	0.7
11	..	..	..	..	0.1	..	..	0.2	..	..	..
2. Fibre-Length (inch):—											
(a) By Balls Sorter	0.84	0.83	0.86	0.82	0.83	0.82	0.83	0.78	0.82	0.83	0.80
(b) By Baer Sorter	0.84	0.87	0.85	0.80	0.82	0.84	0.82	0.76	0.84	0.82	0.80
3. Fibre-Length Irregularity (%)											
.. .. .	..	..	..	12.6	12.6	15.2	14.7	15.0	16.1	18.7	13.5
4. Fibre-Weight per inch (millionth of an ounce)											
.. .. .	0.185	0.216	0.215	0.166	0.186	0.176	0.180	0.188	0.183	0.193	0.182
5. Fibre-Strength (oz.):—											
(a) By Balls Tester	0.171	0.198	0.206	0.170	0.193	0.176	0.181	0.167	0.180	0.183	0.142
(b) By O'Neill Tester .. .. .	..	..	0.192	0.181	0.199	0.198	0.174	0.169	0.202	0.180	0.158
6. Fibre-Strength per unit fibre-weight per inch											
.. .. .	0.92	0.92	0.93	1.06	1.05	1.06	0.99	0.89	1.04	0.96	0.82
7. Fibre-Rigidity (millionth of an ounce, square inch)											
.. .. .	..	0.209	0.193	0.218	0.180	0.192	0.246	..	..	..	..
8. Ribbon-Width (thousandth of an inch)											
.. .. .	..	..	0.62	0.64	0.61	0.63	0.63	..	..	..	..
9. Convolutions per inch											
.. .. .	..	..	72	92	82	69	89	..	..	..	..
10. Maturity Test Results (%):—											
(a) Mature .. .. .	..	..	..	..	..	..	..	..	73	65	77
(b) Half-mature .. .. .	..	..	..	..	..	..	..	..	14	21	13
(c) Immature .. .. .	..	..	..	..	..	..	..	..	13	14	10

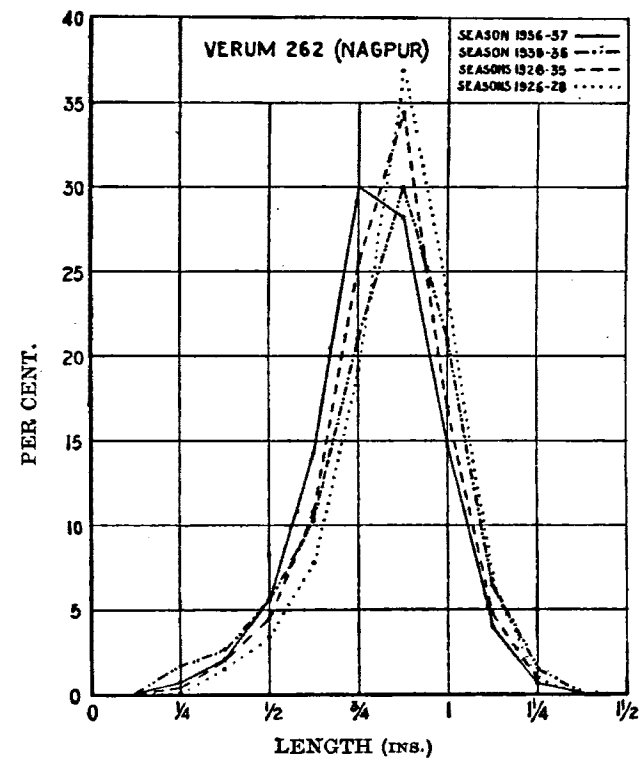


FIG. 12 (a)—Sorter Diagrams for Verum 262 (Nagpur).

IV. SPINNING TESTS.

1. Treatment :—

(a) *Blow-room*.—Upto 1931-32 (inclusive):—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times).

1928-29 and 1932-35 (inclusive):—As above but two passages in the Crighton. 1935-36 and 1936-37:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37:—Same as above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report.—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour ..	White; bright.	White to creamy; bright.	White.	White; bright.	White; bright.	White; bright.	White; very bright.	White; bright.	White; bright.	White; bright.	White.
Cleanliness ..	Very clean, i.e., free of leaf.	Very clean.	A little leafy; slightly stained.	Very clean.	Very clean.	Slightly stained; fairly clean.	Clean.	Very clean.	Very clean.	Very clean.	Very clean.
Feel ..	Silky.	Full-bodied.	..	Good bodied with plenty of cling.	Good bodied.	Good.	Full-bodied; slightly silky.	Smooth and bodied.	Good ..	Smooth and bodied.	Good soft.
Finning and neppiness.	..	..	..	Well-ginned.	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds ..	2.15 percent cut and few small undeveloped seeds.	..	0.82 percent cut and partly ginned seeds.	0.3 per cent. full clean seeds.	..	..	..	..	..	..	..
Card sliver ..	..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean; even.
Card-web ..	..	..	..	..	..	Even; nep-free.	Even; nep-free.	Even; nep-free.	Good ..	Even and nep-free.	Good; even. Almost free of nep.
Weight of ten flat strips.	..	..	..	..	..	13.4 grams ..	11.7 grams ..	11.4 grams ..	10.8 grams ..	11.0 grams ..	11.4 grams.
Remarks ..	..	Strong staple; a very fine cotton.	..	..	..	..	..	..	..	..	..

3. Spinning Test Details and Results.—See Table 12 (a), page 60.

V.—REMARKS.

Fibre.—The mean fibre-length is above the average in the two seasons, 1927-29, but unusually low in 1933-34. The fibre-weight per inch is also high in the former two seasons, but has not varied much since 1929-30. The fibre-strength remained fairly constant between 1929-30 and 1932-33, fell to a low value in 1933-34, recovered again in the following two seasons, but fell to an unprecedentedly low value in 1936-37. This year's sample is slightly shorter but more regular and finer than last year's sample, but its inherent strength is the lowest on record although it contains a higher percentage of mature fibres.

Waste.—Except in 1928-29, the samples of this cotton have been received in a very clean condition and have given low waste losses in the blow-room and the card-room.

Breakages.—Yarn breakages in the ring frame are generally few in 20's counts, but fairly numerous in 26's and 30's counts. In 1933-34, however, they were numerous in all the three counts into which the cotton was spun.

Yarns.—This cotton generally gives even 20's and even to fairly even 26's, though the yarns obtained from the 1933-34 sample are rather less even than usual. Its yarns are, as a rule, almost free of neps, but in 1928-29 and 1929-30 they were rather neppy. Their strength is below the average in 1929-30, 1932-33 and 1935-36 and above the average in 1934-35.

Conclusions.—The performance of this cotton remained fairly constant upto 1931-32, with the exception of 1929-30, when it gave exceptionally poor results. Since 1932-33, the variation has been more frequent, the 1935-36 sample showing a considerable falling off as compared with its predecessor. The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1926-27 ..	24's	1930-31 ..	26's	1934-35 ..	28's
1927-28 ..	26's	1931-32 ..	25's	1935-36 ..	23's
1928-29 ..	26's	1932-33 ..	23's	1936-37 ..	25's
1929-30 ..	21's	1933-34 ..	24's		

TABLE 12 (a).—SPINNING TEST RESULTS FOR VERUM 262 (NAGPUR).

HANK (1936-37)				TRAVELLER COUNTS.												SPINDLE SPEED (1936-37)																																		
Card	Slubber	Inter	Rover	20sA	20sB	26s	30s	20A	20B	26	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32							
..		
..	
..
Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)																									
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.				SINGLE THREAD.																														
												Counts Actual.	Strength lbs.	Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-Work Product.	Counts Actual.	Strength (ozs.)	Irregularity (%)	Weakness Percentage.		Extension (%)	Irregularity (%)	Evenness Class.	Keps per yard.	Turns per Inch Actual.	Spinning Room.	Testing Room.																			
408	1928-29	25-1-29	20A	..	..	..	..	4	185	5.83	16.85	20.0	67.0	8.3	1,340	..	..	..	..	20.4	10.0	11.6	2.0	7.1	6.4	4	2.0	16.2	84	70	65											
628	1929-30	29-11-29	..	..	..	..	..	10	182	5.20	16.85	10.4	72.0	9.6	1,397	..	..	..	..	10.8	9.9	14.5	6.5	6.2	6.7	4	3.3	16.2	84	60	72										
902	1930-31	27-1-31	..	..	..	..	..	40	190	4.90	16.85	20.0	59.1	9.1	1,182	20.1	124.2	4.1	2,496	20.6	10.0	18.6	17.0	7.4	9.3	3	2.8	16.4	81	66	71														
1000	1932-33	30-12-32	..	..	..	..	..	2	178	5.34	16.85	20.2	71.8	7.8	1,450	..	..	..	..	20.3	11.1	12.4	7.5	7.2	8.4	3	1.6	16.2	81	71	70										
2112	1933-34	1-2-34	..	..	..	..	..	412	196	5.16	16.85	20.2	62.0	8.9	1,252	20.0	128.0	3.2	2,560	20.6	10.1	15.8	8.5	6.9	8.8	3	1.4	16.2	77	69	72														
2556	1934-35	5-12-34	..	..	..	..	..	72	192	5.18	16.85	19.8	68.3	9.0	1,352	20.2	125.2	3.3	2,529	20.5	10.6	12.2	3.5	7.0	8.5	4	1.6	16.2	81	64	68														
3002	1935-36	21-12-35	..	..	..	..	..	24	190	5.00	16.85	19.8	82.6	7.1	1,335	20.2	143.7	4.0	2,903	20.4	12.4	13.0	5.5	7.0	8.6	3	0.9	16.2	81	65	74														
3455/1	1936-37	7-1-37	..	..	..	..	..	36	176	4.70	16.85	19.5	66.8	6.9	1,303	19.7	133.6	3.7	2,632	19.7	10.8	14.3	5.0	6.7	10.9	3	2.2	16.1	79	64	66														
3455/2	1936-37	7-1-37	..	..	..	..	..	10	190	4.62	16.85	20.1	62.8	8.5	1,262	20.2	126.8	4.0	2,561	20.1	10.5	14.2	5.5	6.9	7.0	3	0.5	16.4	78	61	73														
408	1928-29	25-1-29	20B	6.0	8.6	0.3	14.2	4	182	5.84	17.98	19.8	80.0	7.4	1,584	..	..	..	..	20.7	11.7	12.9	2.8	7.2	6.9	3	2.0	17.2	82	68	64															
628	1929-30	30-11-29	..	7.6	10.2	0.3	17.4	20	182	5.26	17.98	19.3	85.5	5.6	1,450	..	..	..	..	20.1	11.2	14.1	5.5	7.7	7.4	4	3.4	17.3	83	65	72															
902	1930-31	27-1-31	..	4.3	6.3	0.5	10.3	32	183	4.85	17.98	19.7	72.7	6.9	1,432	19.9	128.2	3.6	2,551	19.9	11.5	12.1	4.7	7.3	8.5	3	2.3	17.5	79	67	66																			
1000	1932-33	30-12-32	..	3.0	7.0	0.3	10.1	8	191	5.34	17.98	20.1	83.5	4.5	1,678	..	..	..	..	20.8	12.2	11.2	2.5	7.3	8.3	3	2.1	17.4	82	71	70															
2112	1933-34	1-2-34	..	5.0	7.6	0.6	12.6	20	192	5.20	17.98	20.3	80.0	6.9	1,624	20.5	130.2	3.0	2,682	20.8	11.2	12.8	5.5	7.2	7.6	2	1.2	17.2	81	67	84																			
2556	1934-35	4-12-34	..	4.8	7.2	0.4	12.1	39	193	5.16	17.98	20.2	76.6	7.0	1,647	20.3	135.0	4.0	2,740	20.5	11.6	11.4	3.5	7.2	8.8	3	1.4	17.2	76	70	72																			
3002	1935-36	21-12-35	..	..	..	..	..	64	196	5.18	17.98	19.7	80.0	5.9	1,576	19.6	136.5	3.3	2,675	20.4	11.9	11.0	3.0	7.2	9.2	4	1.2	17.4	79	61	72														
3455/1	1936-37	7-1-37	..	..	..	..	..	18	198	5.00	17.98	19.6	98.2	3.8	1,925	20.0	154.0	4.4	3,080	20.2	14.2	9.4	0.8	7.0	6.6	3	1.4	17.4	81	65	72														
3455/2	1936-37	8-1-37	..	..	..	..	..	36	188	4.80	17.98	20.2	75.5	7.0	1,525	20.1	133.4	2.4	2,681	20.5	11.2	12.8	6.5	6.0	8.5	3	1.8	17.2	79	65	65														
408	1928-29	17-1-28	24	..	..	..	..	26	200	4.62	17.98	19.5	80.9	7.1	1,578	19.9	137.2	2.8	2,730	19.8	12.0	13.9	9.5	7.0	8.4	3	0.8	17.5	80	63	71															
468	1929-30	25-1-29	..	..	..	..	..	26	202	4.36	17.98	19.5	84.1	6.5	1,640	20.0	136.4	4.0	2,728	20.1	11.7	10.8	4.0	6.8	5.7	3	0.5	17.2	78	63	70														
628	1929-30	2-12-29	26	..	..	..	..	31	168	6.25	20.23	25.7	89.9	9.4	1,925	25.8	86.5	3.9	2,232	25.6	8.4	14.2	6.0	7.0	8.6	6	2.6	19.7	82	67	68															
902	1931-32	2-1-31	..	..	..	..	..	22	185	6.91	20.23	26.1	89.0	9.3	1,409	..	..	..	..	26.3	8.6	13.6	6.8	6.3	10.1	4	2.2	19.4	82	71	70										
1242	1931-32	23-1-32	..	..	..	..	..	32	168	6.85	20.23	25.8	53.2	6.6	1,373	26.2	97.5	2.9	2,534	25.6	8.6	13.6	6.0	8.0	8.0	4	1.4	19.4	81	63	65														
1600	1932-33	3-1-33	..	..	..	..	..	68	164	6.60	20.23	25.7	49.4	9.6	1,270	25.9	100.4	2.6	2,690	26.1	8.2	13.2	6.5	6.4	11.3	4	1.8	19.6	79	73	73														
2112	1933-34	2-2-34	..	..	..	..	..	68	164	6.58	20.23	25.3	52.2	7.2	1,321	25.3	97.8	2.4	2,474	26.2	8.0	12.8	5.8	6.4	10.9	5	1.5	19.5	79	62	72														
2556	1934-35	5-12-34	..	..	..	..	..	6	172	6.50	20.23	26.0	61.8	6.0	1,607	26.2	107.2	2.4	2,809	27.2	9.6	12.2	4.8	6.1	9.4	4	1.4	19.6	82	66	76														
3002	1935-36	21-12-35	..	..	..	..	..	40	150	6.18	20.23	25.7	46.3	7.4	1,190	25.9	96.6	3.2	2,592	26.6	7.8	14.0	8.0	5.8	11.0	4	2.2	19.4	80	67	69														
3455/1	1936-37	8-1-37	..	..	..	..	..	8	145	5.73	20.23	25.2	54.9	7.9	1,383	25.2	103.9	3.2	2,596	25.4	9.0	13.1	4.5	6.9	6.9	4	0.8	19.7	81	65	71														
3455/2	1936-37	11-1-37	..	..	..	..	..	12	146	5.73	20.23	25.1	54.1	8.9	1,358	25.4	108.2	2.5	2,621	27.0	7.7	14.3	5.5	6.0	8.4	4	0.5	19.3	81	62	70														
1242	1931-32	25-1-32	30	..	..	..	..	23	148	7.81	21.86	29.8	40.4	9.4	1,294	30.1	85.0	2.8	2,564	30.6	6.7	17.0	9.5	6.4	10.0	4	1.9	21.0	82	64	66															
1600	1932-33	3-1-33	..	..	..	..	..	74	150	7.62	21.86	30.0	35.0	12.6	1,050	30.4	84.5	2.6	2,569	30.9	6.4	16.0	11.0	6.1	11.4	5	2.1	21.0	80	71	74														
2112	1933-34	2-2-34	..	..	..	..	..	72	150	7.26	21.86	29.0	38.8	11.0	1,125	28.8	85.4	3.0	2,460	29.9	6.8	13.7	8.8	6.0	12.9	6	1.5	21.1	79	63	71														
2556	1934-35	5-12-34	..	..	..	..	..	14	150	7.50	21.86	30.1	45.6	10.2	1,373	30.0	93.2	3.2	2,796	30.5	8.1	14.2	6.2	5.8	12.4	6	1.2	21.0	81	67	75														
3002	1935-36	21-12-35	..	..	..	..	..	40	138	7.27	21.86	30.3	33.7	9.7	1,021	30.9	83.4	4.1	2,577	30.5	6.6	16.1	9.5	5.8	12.7	5	2.5	21.1	79	65	72														
3455/1	1936-37	9-																																																

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.									
	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	..	..	0.3	..	0.9	0.4	0.8	1.3	1.4	1.3
3	1.7	2.3	1.0	2.3	2.6	1.7	2.8	2.6	3.2	2.4
4	3.6	4.1	3.6	4.9	5.4	3.9	5.1	6.2	5.8	6.1
5	8.6	8.5	9.3	13.5	16.2	10.1	12.8	14.8	11.7	15.4
6	23.8	20.9	21.0	30.7	32.4	25.9	28.0	28.1	24.3	28.6
7	43.0	35.5	33.8	31.5	30.0	35.5	29.1	29.3	30.5	24.0
8	16.4	20.7	21.1	13.3	9.9	17.1	15.7	14.0	16.8	13.0
9	2.9	5.9	7.5	8.8	2.6	4.7	4.8	3.5	5.2	3.9
10	..	2.1	1.8	..	..	0.7	0.9	0.2	1.1	1.3
2. Fibre-Length (inch):—										
(a) By Balls Sorter	0.83	0.85	0.85	0.80	0.77	0.83	0.80	0.79	0.81	0.79
(b) By Baer Sorter	0.83	0.82	0.83	0.79	0.78	0.82	0.80	0.80	0.80	0.79
3. Fibre-Length Irregularity (%):—										
4. Fibre-Weight per inch (millionth of an ounce)	0.210	0.187	0.176	0.170	0.174	0.163	0.184	0.165	0.195	0.195
5. Fibre-Strength (oz.):—										
(a) By Balls Tester	0.208	0.181	0.179	0.163	0.164	0.154	0.164	0.174	0.175	0.183
(b) By O'Neill Tester .. .. .	..	0.168	0.163	0.173	0.177	0.146	0.172	0.184	0.187	0.171
6. Fibre-Strength per unit fibre-weight per inch										
7. Fibre-Richly (millionth of an ounce, square inch)	0.99	0.93	0.97	0.99	0.98	0.92	0.91	1.08	0.93	0.91
7. Fibre-Richly (millionth of an ounce, square inch)										
8. Ribbon-Width (thousandth of an inch)	..	0.63	0.63	0.63	0.64	0.62	..	..	..	..
9. Convolutions per inch										
9. Convolutions per inch .. .. .	..	79	88	79	75	86	..	..	..	..
10. Maturity Test Results (%):—										
(a) Mature .. .. .	..	..	..	..	..	..	..	69	69	63
(b) Half-mature .. .. .	..	..	..	..	..	..	..	17	28	20
(c) Immature .. .. .	..	..	..	..	..	..	..	14	13	21

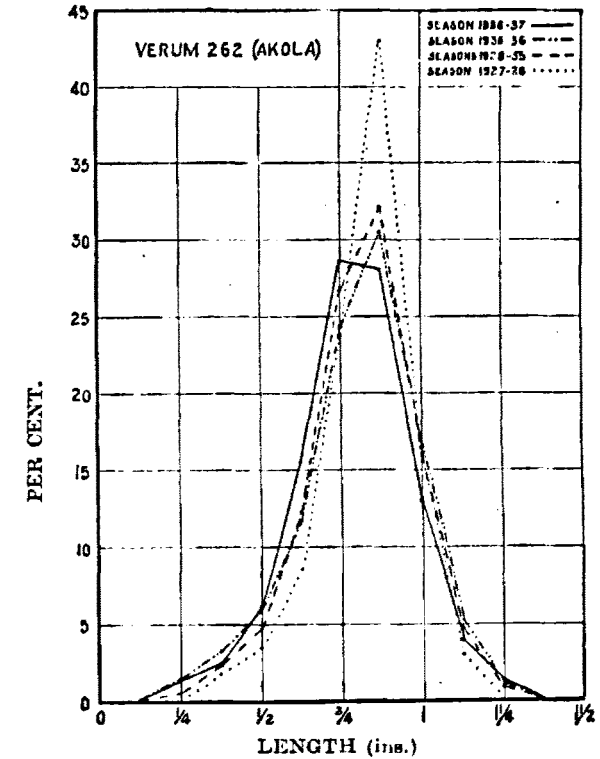


Fig. 12 (b)—Sorter Diagrams for Verum 262 (Akola).

IV.—SPINNING TESTS.

1. *Treatment.*—

(a) *Blow-room.*—Upto 1930-31 (inclusive).—Lattice Feeder, Crighton (once), Hopper, Scutcher (3 times). Upto 1934-35 (inclusive): as above but two passages in the Crighton. 1935-36 and 1936-37: Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper Feeder, Scutcher (3 times).

(b) *Card-room.*—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37:—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report.*—

Season.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour ..	Light-cream; bright.	White to creamy-white; bright.	White to creamy-white; fairly bright.	White to creamy-white, bright.	White; bright.	White; bright.	White; bright.	White; bright.	White; bright.	White; bright.
Cleanliness ..	Too much stained.	Clean	Clean	Clean	Fairly clean ..	Clean	Fairly clean ..	Clean	Clean	Clean
Feel ..	Soft and bodied.	Slightly silky and bodied.	Good	Good	Good	Very good ..	Smooth and bodied.	Smooth and bodied.	Good bodied.	Good bodied.
Ginning and neppiness.	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Well-ginned ..	Very well-ginned.
Seeds ..	0.47 per cent. unginued and partly ginned.	.. ..	0.94 per cent. full clean.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Card sliver ..	.. ..	.. ..	.. ..	Clean	Clean	Clean	Clean	Clean	Clean	Clean
Card-web ..	Very good ..	.. ..	.. ..	Even and clear	Almost nep-free; even.	Even, nep-free.	Even; nep-free.	Good	Good	Even and nep-free.
Weight of 10 flat strips.	.. ..	.. ..	.. ..	14.0 grams ..	13.1 grams ..	12.9 grams ..	12.0 grams ..	13.3 grams ..	10.7 grams ..	11.1 grams.
Remarks ..	Spinning speed reduced in 20sA due to frequent breakages.	.. ..	Staple somewhat irregular.	Front roller speed 5% too high for 20sA and B.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..

3. *Spinning Test Details and Results.*—See Table 12 (b), page 64.

V.—REMARKS.

(i) *Fibre.*—The mean fibre-length of this cotton showed a progressive decline in the two seasons, 1930-32, followed by a small recovery, which, however, failed to bring it to the original level. The fibre-length irregularity has been increasing steadily since 1933-34, but the 1936-37 sample is more regular than its immediate predecessor. The fibre-weight per inch is fairly constant since 1929-30, except in the two seasons 1935-37 when it is rather high. The fibre-strength is also fairly constant since 1928-29, except in 1932-33 when it is unusually low. The 1936-37 sample is very slightly shorter but more regular than its predecessor. Its fibre-weight per inch and fibre-strength are practically the same, but it contains a somewhat higher percentage of immature hairs.

(ii) *Waste.*—Samples of this cotton have generally been picked in a moderately clean condition and the blow-room and the card-room losses have averaged 5 per cent. and 7 per cent. respectively.

(iii) *Breakages.*—This cotton gave fairly numerous yarn breakages in the ring frame in 20's and 26's counts, especially since 1930-31, the notable exception being the 1935-36 sample, which gave few breakages in all the counts into which it was spun.

(iv) *Yarns.*—This cotton usually gives even 20'sA and even to fairly even 26's, but in 1930-31, 1933-34 and 1934-35 its yarns were rather less even than usual. The yarns are generally either free from neps or only slightly neppy, but in 1928-29 and 1930-31 they were rather neppy.

(v) *Conclusions.*—This cotton shows a fair amount of seasonal variation in its spinning performance. The 1932-33 sample gave the best results while the 1930-31 sample gave the worst performance. The following are the highest standard warp counts for which the cotton is adjudged suitable in the different seasons:—

1927-28 .. 19's	1931-32 .. 21's	1935-36 .. 20's
1928-29 .. 23's	1932-33 .. 25's	1936-37 .. 23's
1929-30 .. 21's	1933-34 .. 21's	
1930-31 .. 18's	1934-35 .. 22's	

TABLE 12 (b)—SPINNING TEST RESULTS FOR VERUM 262 (AKOLA).

HANK (1936-37).
 Card 0.17
 Slubber 0.78
 Inter 1.60
 Rover 4.37

TRAVELLER COUNTS.
 20A 3/0
 20B 3/0
 26 5/0

SPINDLE SPEED (1936-37).
 20A 8,300 r.p.m.
 20B 9,200 r.p.m.
 26 8,500 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.													TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)						
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakage per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.				
												Counts Actual.	Strength lbs.	Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lb.).	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.).	Irregularity (%).	Weakness Percentage.	Extension (%).					Irregularity (%).	Evenness class.	Keps per yard.	Turns per Inch Actual.
320	1927-28	2-11-27	20A	6.5	6.5	0.2	12.8	10	185	5.32	10.85	10.2	67.5	7.8	1104	..	..	..	..	19.7	9.8	13.6	6.0	6.3	6.8	3	1.2	10.3	81	64	61
435	1928-29	8-11-28	..	4.4	7.3	0.3	11.7	40	195	4.70	16.85	20.0	60.7	6.5	1214	..	..	..	..	20.4	10.0	13.2	6.5	6.6	7.4	3	3.2	10.4	83	69	71
618	1929-30	7-11-29	..	6.4	6.6	0.2	12.7	25	190	5.13	16.85	19.7	60.2	8.1	1186	20.0	116.9	4.4	2330	20.4	9.0	13.4	5.5	6.5	10.1	3	1.1	10.2	85	68	65	
908	1930-31	14-11-30	..	4.4	7.7	0.6	12.4	78	185	5.20	16.85	19.6	55.4	9.2	1086	19.8	117.6	8.8	2327	20.8	8.9	10.2	6.8	6.8	7.7	3	2.6	10.0	83	64	66	
1594	1932-33	22-12-32	..	4.0	7.7	0.4	12.6	39	195	5.00	16.85	20.0	72.2	7.2	1444	20.2	139.2	3.5	2690	20.2	10.9	15.4	7.8	7.2	8.0	3	1.6	10.0	80	68	74	
2094	1933-34	16-1-34	..	5.2	7.7	0.4	13.0	44	184	5.18	16.85	19.5	65.0	7.4	1269	19.6	127.8	8.4	2505	19.6	9.6	14.0	8.8	6.4	11.9	4	1.6	10.2	78	65	70	
2559	1934-35	7-12-34	..	5.6	8.1	0.4	13.6	60	190	5.00	16.85	20.0	69.9	7.6	1258	20.0	125.8	3.0	2516	20.7	9.9	12.7	5.5	7.0	9.1	4	1.5	10.2	82	73	71	
2983	1935-36	17-12-35	..	5.9	8.2	0.2	13.9	23	176	4.01	16.85	19.7	55.9	9.0	1101	19.4	128.4	4.2	2401	19.8	9.6	14.1	7.0	6.9	7.3	3	1.0	10.1	81	64	69	
3417.1	1936-37	10-11-36	..	3.3	7.7	0.3	11.4	26	178	4.76	16.85	19.2	75.5	8.4	1450	19.2	164.2	3.7	3153	18.9	12.2	12.9	3.5	8.0	7.1	3	1.3	10.0	85	72	77	
3417.2	1936-37	10-11-36	..	3.1	8.4	0.2	11.4	10	178	4.88	16.85	19.1	71.4	5.0	1364	19.3	145.4	2.8	2806	19.1	10.6	13.6	6.6	7.7	8.1	3	1.2	10.2	85	72	75	
320	1927-28	2-11-27	20B	..	..	..	..	13	190	5.43	17.98	19.9	65.0	7.9	1293	..	..	..	..	20.0	10.0	12.5	6.5	6.2	9.6	4	1.0	17.3	83	67	65
435	1928-29	8-11-28	..	..	..	..	..	7	190	4.70	17.98	19.6	70.2	7.0	1404	..	..	..	..	19.7	11.4	11.0	5.5	7.0	6.9	3	3.6	17.3	84	68	72
618	1929-30	7-11-29	..	..	..	..	..	15	192	5.19	17.98	20.0	69.9	5.6	1398	20.2	120.6	3.9	2436	20.4	10.3	11.7	2.7	6.8	8.0	3	0.8	17.3	87	68	65
908	1930-31	13-11-30	..	..	..	..	..	42	192	5.31	17.98	19.7	62.0	8.4	1221	19.9	120.1	3.5	2390	20.4	10.3	13.5	7.0	7.1	6.8	4	3.0	17.2	85	60	68
1241	1931-32	19-1-32	..	..	..	..	..	62	191	5.21	17.98	20.1	69.0	6.4	1347	20.4	121.0	3.2	2468	20.6	9.8	13.8	3.2	7.0	9.0	3	1.9	17.8	81	65	60
1594	1932-33	22-12-32	..	..	..	..	..	29	195	5.00	17.98	19.5	60.6	4.8	1707	19.3	152.4	3.6	2941	19.8	12.7	11.0	2.2	7.7	7.6	3	1.5	17.4	81	69	74
2094	1933-34	18-1-34	..	..	..	..	..	60	190	5.12	17.98	19.4	77.3	6.9	1500	19.6	128.7	3.4	2523	19.8	10.2	12.8	5.5	6.4	11.2	4	1.8	17.3	81	65	74
2559	1934-35	8-12-34	..	..	..	..	..	44	200	5.00	17.98	19.6	70.6	5.7	1501	19.9	129.2	3.6	2571	20.2	11.0	9.3	2.8	7.4	8.7	4	2.1	17.4	81	65	72
2983	1935-36	17-12-35	..	..	..	..	..	5	183	4.61	17.98	19.7	71.2	7.9	1403	19.8	137.2	4.0	2717	20.3	10.3	14.2	7.5	6.9	6.3	3	0.8	17.2	81	66	71
3417.1	1936-37	10-11-36	..	..	..	..	..	52	191	4.76	17.98	19.5	84.2	5.7	1642	19.8	156.0	4.5	3049	19.7	13.0	12.0	4.0	7.8	7.3	3	1.5	17.2	85	72	74
3417.2	1936-37	10-11-36	..	..	..	..	..	52	191	4.76	17.98	19.9	77.0	7.5	1532	19.4	153.8	4.3	2984	20.1	10.8	15.5	7.0	7.8	8.0	3	1.8	17.1	86	72	73
415	1928-29	8-11-28	26	..	..	..	..	26	169	6.13	20.23	20.2	47.7	10.4	1250	..	..	..	..	26.3	7.6	15.7	3.5	6.1	10.4	4	4.0	19.4	85	69	72
618	1929-30	7-11-29	..	..	..	..	..	23	169	6.68	20.23	25.7	42.3	10.1	1087	20.0	85.5	4.7	2223	25.8	7.7	14.2	8.0	6.0	11.8	5	1.1	19.3	89	66	64
908	1930-31	14-11-30	..	..	..	..	..	30	142	6.72	20.23	25.4	37.2	13.0	945	25.5	92.5	3.4	2359	26.1	7.8	13.4	6.0	6.6	9.0	5	2.3	10.4	84	62	66
1241	1931-32	20-1-32	..	..	..	..	..	14	142	6.56	20.23	25.5	45.9	9.3	1170	26.2	92.7	3.5	2429	26.1	7.0	18.4	13.8	6.0	9.4	4	1.6	19.4	81	62	68
1594	1932-33	23-12-32	..	..	..	..	..	38	152	6.62	20.23	25.6	55.5	10.1	1421	25.8	101.1	2.6	2603	25.8	8.8	12.0	4.2	7.0	8.7	4	1.8	10.5	81	68	72
2094	1933-34	18-1-34	..	..	..	..	..	62	154	6.55	20.23	25.2	46.6	9.7	1174	25.6	95.2	2.7	2437	25.9	6.9	17.8	10.0	5.6	14.0	5	1.9	19.6	80	65	74
2559	1934-35	10-12-34	..	..	..	..	..	48	162	6.47	20.23	26.0	44.2	9.2	1149	26.0	95.2	3.0	2475	26.8	7.7	14.2	9.8	6.6	12.8	5	2.3	19.4	81	68	72
2983	1935-36	16-12-35	..	..	..	..	..	4	148	6.03	20.23	26.0	41.9	13.7	1089	26.0	98.4	2.5	2558	26.7	7.2	14.4	8.5	6.8	7.0	4	1.2	19.5	82	67	73
3417.1	1936-37	11-11-36	..	..	..	..	..	90	153	6.22	20.23	25.5	52.3	9.5	1374	25.5	105.8	2.8	2693	26.1	8.3	13.9	7.0	7.0	6.8	4	1.2	19.3	86	72	72
3417.2	1936-37	11-11-36	..	..	..	..	..	20	153	6.19	20.23	25.6	50.5	7.6	1293	25.4	105.6	3.5	2682	25.5	7.8	13.8	6.0	7.3	8.2	5	1.8	19.3	86	72	73

* Diameter of ring frame front roller— $\frac{1}{4}$ ". Diameter of rings— $\frac{1}{16}$ ".

13.—V. 434 (Akola).

Seasons .. { 1933-34 (Sample No. 2218).
 1934-35 (Sample No. 2560).
 1935-36 (Sample No. 2987).
 1936-37 (Sample No. 3418).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium neglectum Verum*.
- (ii) *History* :—A pure line strain first isolated in 1931 and known as V. 434.
- (iii) *District of growth* :—Central Provinces and Berar. The particular samples used in these tests were grown at the Government Experimental Farm, Akola.
- (iv) *Growing period* :—June to November.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—28 inches.
- (vii) *Temperature* :—Maximum temperatures :—June—115° F., January—85° F.
- (viii) *Plant particulars (average values)* :—
- (a) Bolls per plant : 16 to 18.
- (b) Seeds per boll : 26.
- (c) Weight of seed : 62 milligrammes.
- (d) Weight of lint per seed : 30 milligrammes.
- (e) Ginning percentage : 33.
- (ix) *Yield of seed-cotton* :—400 to 800 lbs. per acre according to soil and climatic conditions.
- (x) *Area under cultivation* :—About 120 acres in 1933-34.
- ,, 1,200 ,, 1934-35.
- ,, 5,065 ,, 1935-36.
- ,, 22,000 ,, 1936-37.

II.—GRADER'S REPORT.

	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under	Broach.	Broach.	Broach A/M 1936.	Broach.
Class	Superfine.	Extra superfine.	Extra superfine.	Extra superfine.
Colour	White.	White.	Very white.	Very clean ; bright white.
Staple length	15/16 inch.	15/16 inch.	13/16 inch.	13/16 inch.
Staple strength	Fair.	Fair.	Good but wasty and soft.	Good.
Regularity	Fair.	Fair.	Slightly regular.	Regular.
Value above or below contract rate ..	Rs. 55 on.	Rs. 65 on.	Rs. 40 on.	Rs. 25 on.
Basis	Rs. 190.	Rs. 220.	Rs. 221.	Rs. 219.
Date of valuation	30-4-34.	3-12-34.	21-12-35.	4-12-36.
Remarks .. .. .	..	..	..	Very silky.

III.—FIBRE PARTICULARS.

1. Fibre-length Distribution (Balls Sorter):—				
Mean Group-Length in eighths of an inch. .	Percentage.			
	1933-34.	1934-35.	1935-36.	1936-37.
2	0	0.4	0.6	0.4
3	2.1	1.7	1.8	1.9
4	3.7	4.3	4.0	3.2
5	7.8	10.8	7.6	7.8
6	17.7	22.2	16.3	22.1
7	30.3	31.7	30.3	35.5
8	25.3	21.5	26.6	20.9
9	10.4	6.1	9.9	5.8
10	2.7	1.3	2.7	2.4
11	..	..	0.2	..
2. Fibre-length (Inch):—				
(a) By Balls Sorter	0.88	0.84	0.88	0.86
(b) By Baer Sorter	0.87	0.83	0.86	0.86
3. Fibre-length Irregularity (%)				
	13.6	15.0	15.0	11.8
4. Fibre-weight per inch (millionth of an ounce)				
	0.172	0.167	0.170	0.179
5. Fibre-strength (ozs.):—				
(a) By Balls Tester	0.209	0.153	0.167	0.181
(b) By O'Neill Tester	0.210	0.165	0.186	0.177
6. Fibre-strength per unit fibre-weight per inch				
	1.22	0.95	1.04	1.00
7. Maturity Test Results (%):—				
(a) Mature	..	61	62	63
(b) Half-mature	..	17	26	25
(c) Immature	..	22	12	12

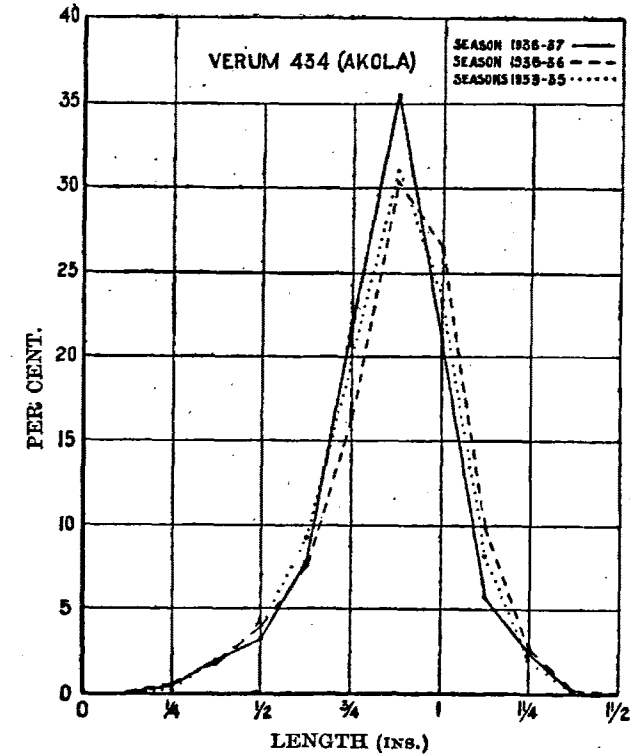


Fig. 13.—Sorter Diagrams for Verum 434 (Akola).

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room* :—Upto 1934-35 (inclusive) :—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1933-34 sample was passed only once through the Crighton.

1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room* :—Upto 1934-35 (inclusive) : Card, Drawing (2 heads), Slubber, Inter, Rover, spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—Card, Drawing (2 heads,) Slubber, Inter, Rover, spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White ; bright.	White ; bright.	White ; bright.	White ; bright.
Cleanliness	Clean.	Clean.	Clean.	Perfectly clean.
Feel	Good soft.	Smooth bodied.	Smooth and bodied.	Smooth and bodied.
Ginning and neppiness	Well-ginned.	Well-ginned.	Well-ginned.	Very well-ginned.
Seeds .. .. .	..	..	..	..
Card sliver	Clean.	Clean.	Clean.	Clean, bright and smooth.
Card web	Even.	Good even.	Even ; nep-free.	Even ; nep-free.
Weight of ten flat strips	13.4 grams.	13.4 grams.	11.0 grams.	12.8 grams.
Remarks .. .. .	..	..	A desirable sample.	..

3. *Spinning Test Details and Results* :—See Table 13 on page 68.

V.—REMARKS.

(i) *Fibre*.—This cotton showed a falling-off in staple length in 1934-35, from which, however, it has recovered in the following two seasons. Its fibre-weight per inch has shown very little variation, but its fibre-strength is variable, the intrinsic strength being 22 per cent. higher in 1933-34 than in 1936-37.

(ii) *Waste*.—This cotton is picked in a fairly clean condition and gave moderately low loss in the blow-room and normal loss in the card-room.

(iii) *Breakages*.—Except for the 1933-34 sample, yarn breakages in the ring frame are generally few upto 26's count, but fairly numerous in the 30's count.

(iv) *Yarns*.—This cotton gives even 20's and even to fairly even 26's yarns. Its yarns are inclined to be slightly neppy. Its performance during the two seasons 1934-36 showed a distinct improvement over that of 1933-34, but in the current season a set-back is noticeable. The following are the highest standard warp counts for which this cotton has been adjudged suitable in the four seasons :—

1933-34	25's.
1934-35	30's.
1935-36	31's.
1936-37	27's.

TABLE 13—SPINNING TEST RESULTS FOR V. 434 (AKOLA).

HANK (1936-37).

Card .. 0.17
 Slubber .. 0.80
 Inter .. 1.78
 Rover .. 4.47

TRAVELLER COUNTS.

20'sA .. 3/0
 20'sB .. 3/0
 26's .. 5/0
 30's .. 7/0

SPINDLE SPEED (1936-37).

20'sA .. 9,100 r.p.m.
 20'sB .. 10,000 r.p.m.
 26's .. 9,200 r.p.m.
 30's .. 9,200 r.p.m.

1 Sample No.	2 Season.	3 Date of Spinning.	4 Counts Nominal.	5 WASTE PERCENTAGES.				6 RING FRAME PARTICULARS.*				7 YARN TEST RESULTS.														29 TEMPERATURE (°F).	30 RELATIVE HUMIDITY (%)					
				8 Blow Room Loss.	9 Card Room Loss.	10 Spinning Loss.	11 Total Loss.	12 Yarn Breakages per 100 spindles per hour.	13 Front Roller Speed R.P.M.	14 Draft.	15 Turns per Inch.	16 LEA.				17 BALLISTIC.			18 SINGLE THREAD.								31 Spinning Room.	32 Spinning Room.	33 Testing Room.			
												19 Counts Actual.	20 Strength (lbs.)	21 Strength Irregularity (%)	22 Count-Strength Product.	23 Counts Actual.	24 Work of Rupture (inch-lb.)	25 Work Irregularity (%)	26 Count-Work Product.	27 Counts.	28 Strength (ozs.)	29 Strength Irregularity (%)	30 Weakness Percentage.	31 Extension (%)	32 Extension Irregularity (%)					33 Evenness class.	34 Neps per yard.	35 Turns per Inch actual.
2560	1934-35	10-12-34	20'sA	4.8	7.9	0.2	12.6	5	193	5.00	16.85	20.1	81.1	5.6	1,630	20.0	137.1	3.6	2,742	20.6	11.8	11.1	2.2	7.8	8.0	2	2.1	16.1	81	66	74	
2987	1935-36	13-12-35	20'sA	7.5	8.0	0.3	15.4	31	196	4.60	16.85	20.5	77.8	9.5	1,595	20.0	145.6	3.5	2,912	20.6	10.9	11.9	5.0	6.8	7.6	3	1.2	16.1	80	66	70	
3418/1	1936-37	16-11-36	20'sA	1.6	8.5	0.3	10.2	5	192	4.59	16.85	20.0	76.4	9.8	1,526	20.2	139.0	2.8	2,808	20.6	10.3	16.4	9.0	7.3	8.4	3	1.2	16.0	86	70	70	
3418/2	1936-37	16-11-36	20'sA	2.5	8.3	0.2	10.8	5	192	4.58	16.85	19.8	75.5	4.9	1,495	20.1	135.8	3.0	2,730	20.8	9.4	17.1	13.0	6.8	6.5	3	1.2	16.3	86	70	69	
2218	1933-34	11-4-34	20'sB	4.5	7.4	0.4	11.9	73	198	6.00	17.98	19.8	81.1	4.7	1,606	19.8	144.2	3.3	2,855	19.5	13.0	10.7	2.0	6.3	9.2	8	1.0	17.4	89	70	70	
2560	1934-35	10-12-34	20'sB	..	..	..	..	16	202	5.00	17.98	20.2	91.1	4.6	1,840	20.0	142.0	3.8	2,840	20.7	12.4	8.8	0.8	7.6	7.6	3	2.2	17.2	81	67	74
2987	1935-36	13-12-35	20'sB	..	..	..	..	21	202	4.60	17.98	19.9	94.8	6.3	1,887	19.6	157.4	3.2	3,085	20.6	11.9	11.4	1.5	6.8	6.2	3	1.0	17.1	81	66	68
3418/1	1936-37	16-11-36	20'sB	..	..	..	..	5	200	4.69	17.98	20.6	86.0	8.2	1,772	21.0	133.2	2.4	2,797	21.6	10.1	14.7	12.0	6.8	9.5	3	1.5	16.9	85	69	67
3418/2	1936-37	16-11-36	20'sB	..	..	..	..	5	200	4.49	17.98	20.2	87.3	4.4	1,763	20.8	138.5	3.5	2,881	20.0	12.2	13.9	6.5	7.1	0.8	3	1.0	17.4	85	69	69
2218	1933-34	11-4-34	26's	..	..	..	..	20	172	6.00	20.23	26.0	56.5	11.5	1,469	26.0	105.2	2.8	2,735	26.6	8.3	11.9	4.0	5.3	9.9	3	0.8	19.4	89	69	70
2560	1934-35	10-12-34	26's	..	..	..	..	8	176	6.45	20.23	25.8	63.7	6.0	1,643	26.1	105.6	3.2	2,756	26.2	9.4	10.8	3.8	7.0	7.4	4	1.9	19.4	81	67	74
2987	1935-36	14-12-35	26's	..	..	..	..	20	166	5.90	20.23	25.4	68.6	5.1	1,742	24.8	111.0	2.7	2,753	25.9	9.1	13.9	5.5	6.4	8.0	4	1.2	19.3	80	66	68
3418/1	1936-37	12-11-36	26's	..	..	..	..	20	166	6.16	20.23	26.7	55.4	7.8	1,479	26.8	104.4	3.0	2,798	27.6	7.2	17.2	11.0	6.3	12.3	4	0.8	19.0	84	76	69
3418/2	1936-37	12-11-36	26's	..	..	..	..	12	166	5.91	20.23	27.2	52.9	9.9	1,439	26.3	102.0	3.1	2,683	27.4	7.2	15.7	9.5	6.2	10.3	4	1.8	19.4	84	76	68
2218	1933-34	11-4-34	30's	..	..	..	..	33	150	6.70	21.86	29.4	46.6	9.3	1,370	29.6	92.0	3.3	2,723	31.1	7.2	11.9	4.0	5.2	12.7	4	1.0	21.1	89	70	69
2987	1935-36	16-12-35	30's	..	..	..	..	20	156	6.97	21.86	30.4	50.0	8.5	1,520	29.4	92.0	2.7	2,705	31.3	6.9	13.0	4.5	6.1	7.5	5	0.8	21.0	80	66	69
3418/1	1936-37	12-11-36	30's	..	..	..	..	17	154	7.03	21.86	30.4	46.1	9.3	1,401	31.6	91.4	2.7	2,888	32.1	6.1	17.3	12.5	6.1	10.8	5	1.0	20.6	84	74	70
3418/2	1936-37	12-11-36	30's	..	..	..	..	13	154	6.84	21.86	31.3	39.6	12.0	1,239	30.7	87.4	2.3	2,683	31.8	6.2	19.4	15.0	5.8	11.4	5	2.0	21.0	84	74	67

* Diameter of ring frame front roller— $\frac{1}{4}$ inch; diameter of rings— $\frac{1}{4}$ inch.

14.—LATE VERUM (Nagpur).

Seasons	..	{	1930-31 (Sample No. 911).
			1931-32 (Sample No. 1244).
			1932-33 (Sample No. 1640).
			1933-34 (Sample No. 2204).
			1934-35 (Sample No. 2557).
			1935-36 (Sample No. 3003).
			1936-37 (Sample No. 3456).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical Species* :—*Gossypium neglectum verum*.
- (ii) *History* :—A pure line selection isolated in 1929 and known as Late Verum.
- (iii) *District of growth* :—Central Provinces and Berar. The particular samples used in these tests were grown at the Government Farm, Nagpur.
- (iv) *Growing period* :—June to December.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—35 to 40 inches.
- (vii) *Temperature* :—Maximum temperatures: June—110° F.; January—85° F.
- (viii) *Plant particulars (average values)* :—
- Bolls per plant : 17.
 - Seeds per boll : 27.
 - Weight of seed : 61 milligrammes.
 - Weight of lint per seed : 27 milligrammes.
 - Ginning percentage : 30.
- (ix) *Yield of seed-cotton* :—400 to 800 lbs. per acre according to soil and climatic conditions.
- (x) *Area under cultivation* :—About 1,500 acres in 1933-34.
- | | | | |
|---|--------|---|----------|
| „ | 10,000 | „ | 1934-35. |
| „ | 18,500 | „ | 1935-36. |
| „ | 29,000 | „ | 1936-37. |

II.—GRADER'S REPORT.

—	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach A/M.
Class	Superfine.	Extra super-fine.	Extra super-fine.	Extra super-fine.	Extra super-fine.	Extra super-fine.	Choice super-fine.
Colour	White.	White.	White.	White.	White.	Bright white.	Bright white.
Feel .. .. .	..	..	..	..	..	..	Very silky.
Staple Length ..	1 inch.	15/16 inch.	31/32 inch.	1 inch.	31/32 inch.	Full 3/4 inch	Full 7/8 inch.
Staple Strength ..	Good.	Fair.	Good.	Good.	Good.	Good.	Very good.
Regularity	Good.	Fair.	Fair.	Fair.	Fair.	Regular.	Very regular.
Value above or below contract rate ..	Rs. 40 on.	Rs. 50 on.	Rs. 50 on.	Rs. 75 on.	Rs. 90 on.	Rs. 35 on.	Rs. 45 on.
Basis	Rs. 194.	Rs. 210.	Rs. 185.	Rs. 198.	Rs. 220.	Rs. 210.	Rs. 228.
Date of valuation ..	29-11-30.	1-2-32.	13-2-33.	6-4-34.	3-12-34.	9-1-36.	30-1-37.
Remarks .. .. .	..	..	..	..	..	..	A desirable cotton.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.						
	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.5	0	0	0.9	0.8	0.4	0.3
3	1.9	1.3	2.0	2.6	2.2	2.4	1.9
4	3.5	3.2	3.4	4.1	4.2	5.0	3.2
5	6.8	7.2	7.4	8.6	9.3	8.8	9.1
6	15.1	13.6	17.6	17.6	18.9	18.2	21.5
7	32.6	32.2	31.4	30.3	28.3	27.4	29.7
8	28.4	31.3	26.0	23.9	24.0	24.6	22.2
9	9.0	8.8	9.8	8.8	9.5	10.3	8.1
10	2.1	2.4	2.4	3.2	2.8	2.7	3.4
11	0.1	0	0	0	0	0.2	0.6
2. Fibre-length (inch) :—							
(a) By Balls Sorter	0.88	0.89	0.88	0.86	0.86	0.86	0.87
(b) By Baer Sorter	0.90	0.88	0.85	0.88	0.86	0.85	0.87
3. Fibre-length Irregularity (%)	14.2	13.8	12.8	16.1	16.1	16.6	12.6
4. Fibre-weight per inch (millionth of an ounce)	0.184	0.181	0.184	0.175	0.189	0.180	0.176
5. Fibre-strength (oz.) :—							
(a) By Balls Tester	0.166	..	..	0.185	0.173	0.184	0.188
(b) By O'Neill Tester	0.158	..	..	0.197	0.183	0.188	0.194
6. Fibre-strength per unit fibre-weight per inch ..	0.88	..	..	1.09	0.94	1.00	1.09
7. Maturity Test Results (%) :—							
(a) Mature .. .. .	..	..	..	..	70	67	63
(b) Half-mature.. .. .	..	..	..	..	14	20	19
(c) Immature .. .. .	..	..	..	..	16	13	18

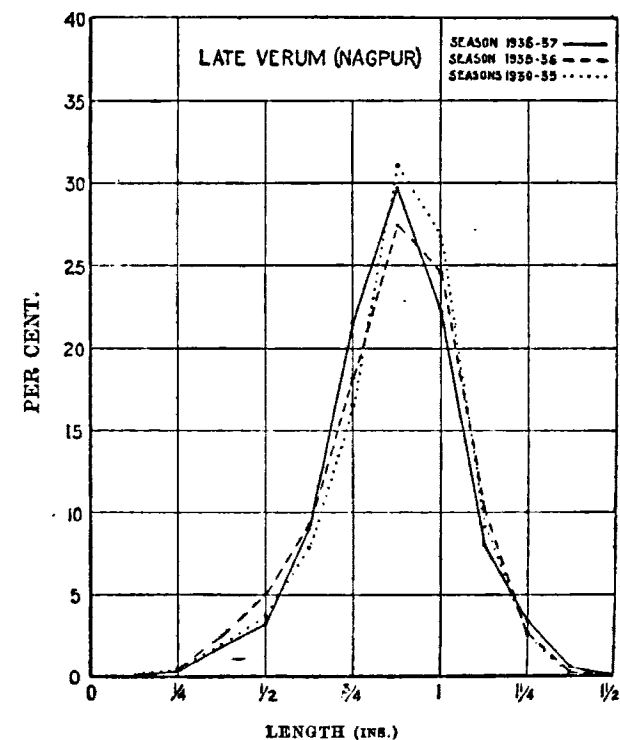


FIG. 14.—Borter Diagrams for Late Verum (Nagpur).

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1934-35 (inclusive):—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1930-31 and 1933-34 samples were passed through the Crighton once only.

1935-36 and 1936-37:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust-trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. I.

1935-36 and 1936-37:—Same as above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White; very bright.	White; bright	White; bright	White; 'pearly bright.	White; very bright.	White; bright.	White.
Cleanliness	Very clean	Very clean	Fairly clean	Perfectly clean.	Perfectly clean.	Perfectly clean.	Very clean.
Feel	Nicely soft and bodied.	Good softish	Good	Smooth and bodied.	Good soft	Smooth and bodied.	Soft and smooth.
Ginning and neppiness	Very well ginned.	Well-ginned	Very well-ginned.	Well-ginned	Well-ginned	Well-ginned	Well-ginned.
Seeds .. ..	..	Clean	Clean	Clean	Clean	Clean	Clean
Card sliver .. ..	..	..	..	..	..	..	..
Card web .. ..	..	Even and nep-free.	Even and nep-free.	Even and nep-free.	Good; even	Even and nep-free.	Clean, even but a little neppy.
Weight of ten flat strips .. ..	..	12.7 grams	11.1 grams	12.4 grams	10.8 grams	10.4 grams	11.1 grams.
Remarks	A very strong cotton.	..	..	A very desirable cotton.	..	..	..

3. *Spinning Tests Details and Results* :—See Table 14 on page 72.

V.—REMARKS.

(i) *Fibre*.—This cotton has shown remarkable consistency in its fibre test results, especially since 1932-33, the earlier samples being slightly longer in staple. The 1936-37 sample has practically the same mean fibre-length, fibre-weight per inch, maturity count, and fibre-strength as its predecessor, but in addition is somewhat more regular in length.

(ii) *Waste*.—This cotton has been picked in a very clean condition and has uniformly given a low blow-room loss. The card-room loss is 7-8 per cent.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few even upto 30's counts, though in the case of the 1932-33 and 1933-34 samples they were fairly numerous in the two higher counts into which this cotton was spun.

(iv) *Yarns*.—This cotton generally gives even 20's and even to fairly even 26's. Its yarns are somewhat neppy, those of 1934-35 being better than the others in this respect.

(v) *Conclusions*.—This cotton has shown very little variation in its fibre-properties and has given good spinning performance for its class. A small improvement in the latter is noticeable since 1933-34, which reached its peak value in 1934-35, when this cotton gave the best results. From its yarn-strength results, this cotton has been adjudged suitable for spinning upto the following highest standard warp counts :—

1930-31	..	30's.	1934-35	..	36's.
1931-32	..	29's.	1935-36	..	33's.
1932-33	..	31's.	1936-37	..	31's.
1933-34	..	34's.			

TABLE 14.—SPINNING TEST RESULTS FOR LATE VERUM (NAGPUR).

HANK (1936-37).

TRAVELLER COUNTS.

SPINDLE SPEED (1936-37).

Card 0.16
 Slubber 0.72
 Inter 1.62
 Rover 4.46

20'sA 3/0
 20'sB 3/0
 26's 5/0
 30's 7/0

20'sA 9,125 r.p.m.
 20'sB 10,000 r.p.m.
 26 9,200 r.p.m.
 30 9,250 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Combs.	Strength (oz.)	Irregularity (%)	Weakness Percentage.	Extension (%)	Irregularity (%)					Evenness Class.	Neps per yard.	Turns per inch Actual.
911	1930-31	24-11-30	20A	3.0	7.1	0.4	10.2	10	188	5.32	16.85	20.2	79.4	6.2	1,604	..	..	..	20.9	10.5	9.6	1.8	6.6	7.5	4	2.4	16.1	86	68	64	
2557	1931-35	7-12-34	20A	4.2	7.0	0.4	11.2	10	194	4.94	16.85	20.0	95.2	4.8	1,904	10.0	148.0	9.5	2,963	29.3	13.8	8.1	0.5	6.8	7.8	3	0.9	16.2	82	68	72	
3003	1931-36	27-12-35	20A	2.2	9.0	0.2	11.8	26	182	4.79	16.85	20.3	76.7	6.2	1,557	20.4	140.4	3.0	2,864	20.4	11.1	11.9	4.0	7.5	8.7	3	1.2	16.6	85	65	64	
8456 1	1936-37	15-1-37	20A	2.2	6.9	0.4	10.1	47	196	4.68	16.85	21.1	68.3	6.9	1,441	20.6	137.6	3.8	2,835	21.6	9.9	12.3	8.5	6.5	9.5	3	1.5	15.9	79	67	68	
8456 2	1936-37	15-1-37	20A	2.0	6.8	0.4	9.1	6	192	4.68	16.85	19.9	79.4	6.3	1,580	19.9	144.8	8.6	2,882	21.0	10.3	13.8	7.5	7.0	8.3	3	1.5	16.1	80	64	69	
911	1930-31	25-11-30	20B	..	..	..	..	15	193	5.26	17.98	20.0	89.2	5.5	1,784	..	..	..	20.6	11.4	11.3	3.5	7.0	7.8	3	2.7	17.2	84	68	62	
1244	1931-32	1-2-32	20B	2.7	7.4	0.4	10.2	0	193	6.10	17.98	20.0	87.9	4.7	1,758	..	..	..	20.6	11.8	9.8	2.0	6.9	8.0	3	1.7	17.1	81	70	67	
1640	1932-33	2-2-33	20B	5.2	6.9	0.4	12.0	21	197	6.05	17.98	19.6	87.8	3.6	1,721	..	..	..	19.8	10.9	13.7	7.0	7.8	8.4	3	1.5	17.2	81	65	74	
2204	1933-34	10-4-34	20B	2.3	7.9	0.4	10.4	5	198	6.10	17.98	19.9	88.5	3.7	1,761	20.2	135.8	3.7	2,743	21.3	10.1	14.4	8.0	6.2	9.4	2	1.2	17.1	89	68	70	
2557	1934-35	7-12-34	20B	..	..	..	..	10	200	5.00	17.98	20.4	100.8	5.7	2,056	20.3	155.4	4.2	3,155	20.8	14.0	8.6	0.8	6.8	8.2	3	0.9	17.8	82	65	78
3003	1935-36	27-12-35	20B	..	..	..	..	5	188	4.79	17.98	20.4	88.4	5.2	1,803	20.3	149.4	3.9	3,033	20.3	12.2	12.0	2.5	7.6	7.9	3	1.8	17.9	84	59	65
8456 1	1936-37	15-1-37	20B	..	..	..	..	0	198	4.68	17.98	20.1	92.8	6.0	1,865	19.8	154.0	4.1	3,049	20.5	12.0	10.2	0	6.6	9.9	3	1.8	17.1	80	65	70
8456 2	1936-37	15-1-37	20B	..	..	..	..	5	203	4.78	17.98	20.3	88.6	6.3	1,799	20.1	145.4	4.0	2,923	21.1	11.2	12.1	5.0	7.2	6.3	3	1.5	17.3	80	65	67
911	1930-31	25-11-30	26	..	..	..	..	20	174	6.90	20.23	26.0	60.8	5.7	1,581	..	..	..	26.8	8.0	11.0	2.8	6.2	9.4	4	2.8	19.3	82	65	64	
1244	1931-32	11-2-32	26	..	..	..	..	15	172	6.71	20.23	25.7	61.8	4.8	1,588	..	..	..	26.6	7.9	10.1	1.0	6.4	9.8	3	2.7	19.4	82	67	67	
1640	1932-33	3-2-33	26	..	..	..	..	21	175	5.98	20.23	25.9	61.5	5.0	1,593	..	..	..	27.0	6.9	13.7	5.0	6.8	8.9	4	1.8	19.6	80	68	72	
2204	1933-34	9-4-34	26	..	..	..	..	30	170	5.93	20.23	25.1	66.9	6.9	1,679	25.9	103.6	8.1	2,083	25.8	8.5	12.8	4.5	5.8	11.2	3	1.5	19.3	89	69	68
2557	1934-35	6-12-34	26	..	..	..	..	6	172	6.47	20.23	26.0	70.5	5.2	1,833	26.2	110.0	2.9	2,882	26.6	10.1	10.3	1.0	6.2	8.0	4	0.6	19.6	82	66	78
3003	1935-36	23-12-35	26	..	..	..	..	12	151	6.18	20.23	26.4	61.7	6.2	1,629	26.6	104.0	2.8	2,766	26.5	8.6	13.0	4.5	6.8	8.3	4	2.5	20.0	80	64	63
8456 1	1936-37	13-1-37	26	..	..	..	..	0	162	5.95	20.23	26.0	61.7	7.0	1,604	26.2	109.6	2.5	2,872	26.4	8.7	13.1	3.5	6.0	6.3	4	1.2	19.2	80	65	69
8456 2	1936-37	13-1-37	26	..	..	..	..	20	162	5.97	20.23	25.7	62.8	6.9	1,614	26.0	105.8	2.5	2,814	26.8	8.3	13.0	4.0	6.4	8.2	5	2.0	19.0	82	63	69
1244	1931-32	12-2-32	30	..	..	..	..	20	159	7.73	21.86	29.7	47.3	5.9	1,405	..	..	..	30.5	6.6	12.5	2.0	5.9	9.4	4	2.7	21.2	82	69	65	
1640	1932-33	3-2-33	30	..	..	..	..	60	159	6.89	21.86	29.5	50.2	6.1	1,481	..	..	..	29.9	6.4	12.7	3.0	6.4	10.4	4	2.0	21.2	81	65	70	
2204	1933-34	9-4-34	30	..	..	..	..	33	152	6.62	21.86	29.1	54.5	6.8	1,586	29.8	89.4	3.5	2,664	30.6	6.7	15.7	8.0	5.1	13.0	4	1.5	21.0	88	72	68
2557	1934-35	6-12-34	30	..	..	..	..	10	150	7.36	21.86	30.2	59.0	4.4	1,782	29.1	97.6	2.4	2,840	30.7	8.6	9.8	2.2	5.8	10.0	5	0.8	21.1	82	66	72
3003	1935-36	23-12-35	30	..	..	..	..	13	143	6.97	21.86	29.5	53.5	8.0	1,578	29.8	98.2	2.8	2,867	29.1	7.6	12.1	4.0	6.9	7.0	5	2.2	21.7	79	63	69
8456 1	1936-37	4-2-37	30	..	..	..	..	25	154	6.77	21.86	29.8	49.8	10.7	1,484	30.5	92.8	2.8	2,830	30.5	6.8	13.1	6.0	5.9	9.9	5	1.8	21.0	81	67	68
8456 2	1936-37	4-2-37	30	..	..	..	..	20	154	7.00	21.86	29.9	49.6	8.9	1,483	31.0	89.6	2.8	2,778	30.4	7.0	14.7	8.5	6.6	10.6	5	2.2	20.7	83	68	68
2557	1934-35	17-12-34	34	..	..	..	..	12	146	8.28	23.26	33.4	49.2	5.6	1,643	33.6	87.6	2.6	2,943	34.4	7.4	13.2	5.0	5.8	13.8	5	0.9	22.5	81	67	72

* Diameter of ring-frame front roller: 7". Diameter of rings: 11".

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—

Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.2	0.8	0.9	0.4	0.5	..	0.8	..	0.6	0.2	0.8	0.2	1.1
3	1.7	1.7	2.2	1.8	2.2	2.2	2.3	2.1	2.7	1.9	2.4	2.0	2.3
4	3.7	3.8	4.5	4.2	4.1	4.8	5.1	5.6	5.9	4.0	5.3	4.7	5.7
5	9.1	10.2	10.9	11.3	8.8	11.0	14.2	14.0	12.2	10.7	12.4	13.3	13.6
6	20.7	23.0	24.6	26.9	21.6	25.5	30.5	31.1	23.8	23.6	26.0	29.9	26.0
7	37.0	37.0	36.4	36.0	34.5	35.5	30.8	32.9	32.1	32.7	30.4	28.9	28.6
8	21.1	17.7	15.8	15.7	21.8	10.7	12.3	11.3	17.0	19.5	17.7	15.9	10.6
9	5.6	4.2	4.2	3.3	5.5	4.3	3.5	3.0	4.8	5.9	4.1	4.4	4.8
10	0.9	1.0	0.5	0.4	1.0	..	0.5	..	0.9	1.5	0.8	0.7	1.3
11	..	..	..	..	..	..	..	..	..	..	0.1	..	..
2. Fibre-Length (inch):—													
(a) By Balls Sorter ..	0.85	0.83	0.81	0.82	0.84	0.82	0.79	0.79	0.81	0.84	0.81	0.81	0.81
(b) By Baer Sorter ..	0.86	0.83	0.82	0.81	0.83	0.80	0.81	0.79	0.81	0.82	0.82	0.82	0.83
3. Fibre-Length Irregularity (%) ..													
..	..	..	..	..	..	14.8	14.0	13.7	17.9	13.9	16.3	12.3	16.6
4. Fibre-Weight per inch (millionth of an ounce)													
..	0.184	0.184	0.200	0.192	0.185	0.152	0.175	0.172	0.175	0.166	0.169	0.160	0.188
6. Fibre-Strength (oz.):—													
(a) By Balls Tester ..	..	..	0.193	0.169	0.184	0.162	0.170	0.164	0.169	0.190	0.161	0.176	0.157
(b) By O'Neill Tester ..	..	..	0.180	0.190	0.169	0.181	0.182	0.163	0.162	0.192	0.182	0.181	0.159
6. Fibre-Strength per unit fibre-weight per inch ..													
..	..	..	0.93	0.94	0.96	1.13	1.01	0.95	0.95	1.15	1.01	1.12	0.84
7. Fibre-Rigidity (millionth of an ounce, square-inch) ..													
..	..	..	0.160	0.188	0.196	0.185	0.189	0.254	0.181	0.178	..	..	..
8. Ribbon-Width (thousandth of an inch) ..													
..	0.63	0.72	0.67	0.63	0.63	0.64	0.67	0.66	0.65	0.68	..	..	..
9. Convolutions per inch													
..	78	87	65	93	88	90	122	92	87	77	..	..	..
10. Maturity Test Results (%)													
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	67	63	61
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	15	19	18
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	18	18	21

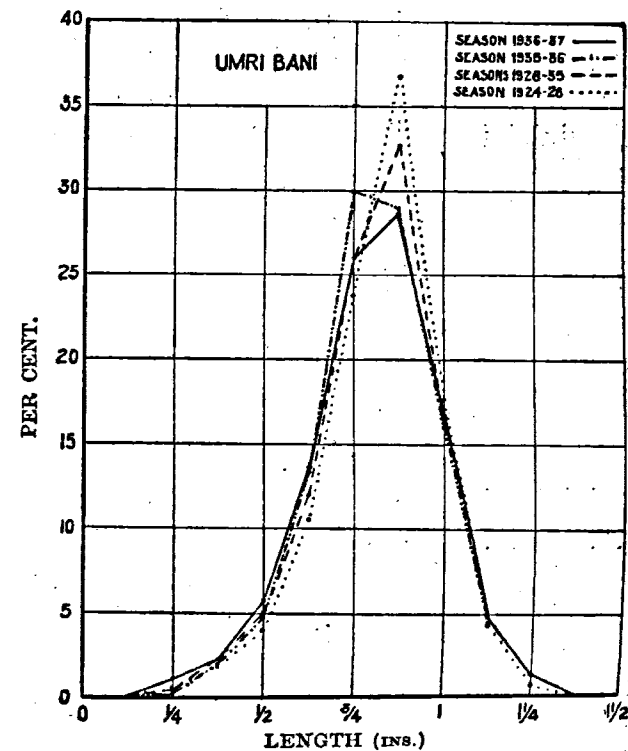


Fig. 15.—Sorter Diagrams for Umri Bani.

IV.—SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room* :—Upto 1934-35 (inclusive) :—Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times).

1935-36 and 1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room* :—Upto 1934-35 (inclusive) :—Card, Drawing (2 heads), Slubber, Inter, Rover, and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—Same as above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	White ..	Creamy to creamy-white; dull.	Creamy-white.	Creamy-white; somewhat dull.	White to creamy-white; very bright.	White to creamy-white; bright.	White to creamy-white.	White; brightish.	White; fairly bright.	White to creamy-white.	White to creamy-white.
Cleanliness ..	Fine leaf in excess.	Stained; very leafy (fine).	Leafy; slightly stained.	Too much sand; very fine leaf; a little stained.	A trifle leafy.	Slightly stained; leafy.	Leafy.	Somewhat leafy.	Very leafy.	Leafy.	Leafy with occasional stain.
Feel .. ..	..	..	Good.	Softish.	Good.	Good.	Good.	Good soft.	Good.	Good smooth.	Good smooth.
Ginning and nep-piness.	Knotted and strung.	Stringy.	Fairly well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	A little knotted in ginning.	Well-ginned.
Seeds	0.86 per cent. clean, unginned and too much cut.	..	0.55 per cent. complete; some not ginned.	1 per cent. seeds.	..	..	1 per cent. ginned & unginned.	..	..	..	..
Card sliver ..	..	..	..	Clean and nep-free.	Clean.	A little leafy.	Practically clean.	Clean.	Almost clean.	Almost clean.	Leafy.
Card-web ..	A little neppy.	..	..	..	First class; shed a deal of fly.	Even; nep-free.	Good.	Even; nep-free.	Good.	Good.	Good.
Weight of ten flat strips.	..	..	..	..	Light; 11.3 grams.	15.6 grams.	15.9 grams.	13.6 grams.	14.8 grams.	12.1 grams.	14.0 grams.
Remarks ..	..	Spinning speed reduced in 30's due to frequent breakages.	..	..	Staple fairly regular.	..	Good tenacity.	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 15 on page 76.

Card Production for Sample No. 82 :—12.0 lb. per hour.

Ring Frame Production for 20's-A, Sample No. 82 :—7.87 oz. per spindle per 10 hours.

V.—REMARKS.

(i) *Fibre*.—With few exceptions the chief fibre-properties of this cotton show very little seasonal variation. Its fibre-weight per inch is rather low in 1929-30 and high in 1936-37, while its mean fibre-length is somewhat low in the two seasons, 1930-32. The 1936-37 cotton has practically the same mean fibre-length as its predecessor, but is more irregular, coarser and weaker, the intrinsic strength being lowest recorded.

(ii) *Waste*.—This cotton contains a fair amount of trash and, except in 1930-31 and 1936-37, has given 10-11 per cent. blow-room loss. Its card-room loss generally lies between 8 and 9 per cent.

(iii) *Breakages*.—Yarn breakages in the ring frame are generally few in 20's counts, but fairly numerous in 24's and 30's counts.

(iv) *Yarns*.—The 20's yarns of this cotton are either even or even to fairly even. Upto 1928-29 its yarns were somewhat neppy, but since then there has been an improvement in this respect. The yarn-strength results also show an improvement since that season.

(v) *Conclusions*.—This cotton would decidedly gain by being picked in a cleaner state. The improvement in spinning performance noticed since 1928-29 has been maintained and the 1935-36 sample gave the best results. The following are the highest standard warp counts for which this cotton is suitable in different seasons :—

1924-25 ..	22's.	1929-30 ..	27's.	1934-35 ..	30's.
1925-26 ..	24's.	1930-31 ..	28's.	1935-36 ..	34's.
1926-27 ..	24's.	1931-32 ..	27's.	1936-37 ..	30's.
1927-28 ..	24's.	1932-33 ..	28's.		
1928-29 ..	22's.	1933-34 ..	29's.		

TABLE 15.—SPINNING TEST RESULTS FOR UMRI BANI.

HANK (1936-37).

Card	..	0.16
Slubber	..	0.74
Inter	..	1.65
Rover	..	4.40

TRAVELLER COUNTS.

20sA	..	3/0
20sB	..	3/0
24s	..	4/0
30s	..	7/0

SPINDLE SPEED (1936-37).

20sA	..	9,200	r.p.m.
20sB	..	10,000	r.p.m.
24s	..	10,000	r.p.m.
30s	..	9,200	r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY(%)							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.				SINGLE THREAD.					Spinning Room.	Spinning Room.	Testing Room.					
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lb.)	Work Irregularly (%).	Count-Work Product.	Counts.	Strength (ass.)	Strength Irregularity (%).	Weakness Percentage.					Extension (%).	Extension Irregularity (%).	Evenness class.	Neps per yard.	Turns per Inch actual.
451	1924-28	18-12-28	20A	..	..	..	..	14	183	5.16	16.85	19.9	65.4	8.1	1,301	..	..	..	..	21.7	9.6	13.7	7.0	5.6	11.3	4	3.6	16.3	80	68	59
635	1929-30	13-12-29	..	..	..	..	..	35	193	5.33	16.85	20.0	61.9	9.7	1,236	..	..	..	..	20.1	10.4	13.7	6.5	6.6	7.6	4	3.1	16.3	79	66	68
1595	1932-33	24-12-32	..	..	..	..	..	22	181	5.10	16.85	19.6	77.9	7.4	1,519	19.6	128.6	3.0	2,520	20.0	11.9	12.6	6.5	7.7	7.0	3	1.4	16.3	82	69	68
2610	1934-35	11-12-33	..	..	..	..	..	34	195	5.11	16.85	20.2	78.2	5.4	1,580	20.0	135.3	3.1	2,079	20.5	11.6	12.7	6.5	7.7	6.9	3	1.4	16.3	79	69	74
3018	1935-36	9-1-35	..	..	..	..	..	20	193	5.13	16.85	20.0	84.9	4.6	1,692	20.2	137.8	3.4	2,290	20.5	11.9	11.9	4.2	7.7	6.6	3	1.5	16.4	83	65	71
3430	1936-37	23-11-36	..	..	..	..	..	26	196	4.90	16.85	19.9	89.2	5.3	1,775	19.8	144.6	3.5	2,763	19.8	12.3	9.7	1.0	7.1	5.5	3	1.5	15.8	75	62	73
451	1924-28	18-12-28	20B	13.0	9.0	0.5	21.1	10	174	5.20	17.98	19.9	76.1	8.1	1,514	..	..	..	..	20.4	11.3	11.3	3.0	6.2	9.8	4	3.8	17.5	80	68	63
635	1929-30	13-12-29	..	11.7	8.0	0.2	19.8	10	193	5.33	17.98	19.8	78.8	6.8	1,571	..	..	..	..	20.2	11.5	12.5	5.7	6.3	7.5	4	4.7	17.4	80	66	69
1595	1932-33	24-12-32	..	12.0	8.1	0.2	19.3	15	186	5.15	17.98	19.8	82.0	5.3	1,624	19.5	132.6	3.3	2,586	20.5	11.9	12.5	5.2	7.2	6.0	4	1.1	17.4	83	66	67	
2610	1934-35	9-1-35	..	8.9	7.1	0.4	15.6	0	196	5.32	17.98	20.4	88.6	6.6	1,607	20.4	181.8	3.4	2,680	20.9	13.1	11.2	3.0	7.4	9.0	3	1.4	17.0	81	69	70	
3018	1935-36	7-1-36	..	10.4	9.3	0.4	19.2	18	193	5.20	17.98	20.2	83.5	4.5	1,807	20.4	128.4	3.2	2,619	20.4	12.2	10.4	2.0	7.3	9.4	4	1.4	17.4	80	65	70	
3430	1936-37	10-12-36	..	13.4	9.2	0.6	21.8	21	194	5.11	17.98	19.8	90.8	4.3	1,793	19.4	145.0	4.0	2,813	19.8	13.3	11.6	3.0	7.6	9.6	3	1.1	17.1	79	69	74	
451	1924-28	18-12-28	20B	11.2	8.3	0.4	19.0	42	196	5.38	17.98	20.0	91.2	4.0	1,824	19.8	142.3	3.6	2,818	20.2	13.3	9.6	1.2	7.4	8.4	3	1.1	17.5	83	65	69	
635	1929-30	13-12-29	..	12.0	8.4	0.4	19.8	10	200	5.13	17.98	20.2	91.4	4.0	1,846	20.0	139.7	3.4	2,794	20.6	12.6	11.4	8.5	6.9	8.6	3	1.5	17.0	83	66	70	
1595	1932-33	24-12-32	..	11.6	8.2	0.3	19.1	5	204	4.90	17.98	19.7	105.0	5.3	2,068	19.9	146.2	2.6	2,909	19.1	14.4	8.9	0.5	8.2	8.4	3	2.0	17.0	74	63	66	
2610	1934-35	9-1-35	..	9.8	10.4	0.4	19.0	10	202	4.71	17.98	20.0	91.6	6.7	1,832	20.1	142.0	5.6	2,854	19.9	13.4	15.6	7.5	7.1	7.2	3	1.5	17.8	83	69	70	
3018	1935-36	7-1-36	..	9.5	10.0	0.4	18.9	0	202	4.90	17.98	20.0	89.8	8.3	1,796	20.3	130.0	3.3	2,639	20.7	12.6	6.0	7.0	9.3	3	1.8	17.6	83	67	66		
451	1924-28	19-12-28	21	..	..	..	..	13	167	6.46	19.73	23.9	56.0	8.6	1,388	..	..	..	..	24.0	9.3	13.9	6.9	6.9	8.8	5	5.2	19.2	81	63	70
635	1929-30	14-12-29	..	..	..	..	..	24	167	6.13	19.73	23.1	66.7	6.0	1,541	23.5	101.0	4.7	2,373	23.7	9.9	12.1	4.0	7.1	7.9	5	1.8	19.0	83	69	66
1595	1932-33	24-12-32	..	..	..	..	..	6	173	6.83	19.73	23.5	72.4	4.9	1,701	23.6	109.6	2.5	2,587	23.8	11.4	10.8	3.0	7.4	8.7	4	1.8	18.9	80	64	70
2610	1934-35	9-1-35	..	..	..	..	..	22	174	6.05	19.73	23.4	69.4	6.1	1,624	23.8	107.5	3.0	2,558	23.8	10.1	10.5	3.0	7.0	8.5	4	2.1	19.2	81	69	66
3018	1935-36	7-1-36	..	..	..	..	..	25	175	6.25	19.73	23.7	71.5	5.4	1,695	23.8	109.5	3.0	2,606	24.2	10.2	9.4	3.8	7.2	7.6	4	1.4	19.0	80	67	73
451	1924-28	19-12-28	21	..	..	..	..	32	178	6.58	19.73	24.0	69.6	4.4	1,764	24.0	132.2	3.4	2,650	25.0	9.7	9.6	2.5	7.0	9.0	4	1.5	19.2	82	67	73
635	1929-30	14-12-29	..	..	..	..	..	20	184	8.12	19.73	24.0	73.5	5.4	1,764	24.0	132.2	3.4	2,717	24.8	10.0	11.0	3.0	6.4	8.0	4	1.4	18.0	82	70	72
1595	1932-33	24-12-32	..	..	..	..	..	27	186	5.83	19.73	23.9	78.6	5.6	1,870	23.4	122.4	2.6	2,864	23.2	11.3	10.0	2.0	7.2	8.3	4	1.5	19.1	75	62	67
2610	1934-35	9-1-35	..	..	..	..	..	14	186	5.71	19.73	23.8	71.4	6.1	1,699	24.4	108.0	2.8	2,635	24.8	9.6	12.7	5.5	6.5	10.7	4	2.0	18.9	82	70	69
3018	1935-36	7-1-36	..	..	..	..	..	15	140	7.81	21.86	29.9	39.9	10.8	1,193	..	..	..	..	81.2	5.8	15.6	5.7	12.4	5	5.1	21.4	83	68	69	
3430	1936-37	13-12-36	..	..	..	..	..	35	161	7.58	21.86	30.6	42.1	8.8	1,288	30.2	83.8	2.7	2,531	32.4	7.4	13.8	8.2	6.3	11.7	5	2.2	20.8	81	68	71
451	1924-28	20-12-27	30	..	..	..	..	47	152	7.65	21.86	30.0	41.8	9.1	1,254	30.2	83.4	3.8	2,519	30.4	6.3	17.7	12.0	8.2	9.6	5	2.4	21.2	81	67	67
635	1929-30	11-2-31	..	..	..	..	..	33	153	7.74	21.86	29.8	46.8	7.6	1,395	30.2	83.6	3.0	2,525	30.6	7.4	13.0	6.5	6.4	11.6	5	1.6	21.2	80	68	72
1595	1932-33	24-12-32	..	..	..	..	..	56	156	8.02	21.86	30.2	47.6	6.1	1,438	30.0	87.2	2.3	2,616	30.8	7.4	13.0	4.0	6.4	13.8	5	1.5	21.4	81	64	76
2610	1934-35	13-12-33	..	..	..	..	..	33	157	7.50	21.86	29.5	49.6	5.8	1,478	29.8	87.3	2.3	2,602	30.4	7.5	12.1	3.8	5.9	10.0	5	1.8	20.8	82	66	70
3018	1935-36	8-1-36	..	..	..	..	..	13	156	7.42	21.86	30.4	54.4	8.1	1,654	29.6	91.2	3.0	2,700	30.2	7.9	13.2	7.0	6.8	7.9	5	1.2	21.2	73	62	67
3430	1936-37	30-11-36	..	..	..	..	..	30	154	7.12	21.86	30.3	48.6	9.0	1,473	30.5	88.2	3.0	2,600	31.4	6.8	13.6	5.5	5.8	10.4	4	1.2	21.1	84	70	70
451	1924-28	19-12-27	30	..	..	..	..	10	154	7.21	21.86	29.8	49.6	9.8	1,478	29.8	88.4	2.6	2,590	29.6	7.9	10.8	3.0	6.8	9.5	4	1.5	20.8	83	65	66

* Diameter of ring frame front roller—1/2 inch; diameter of rings—1/4 inch.

16.—CAMBODIA Co. 2. (Cambodia 440).

Seasons	}	1924-25 (Sample No. 50).
		1925-26 (Sample No. 124).
		1926-27 (Sample No. 268).
		1927-28 (Sample No. 375).
		1928-29 (Sample No. 505).
		1929-30 (Sample No. 706).
		1930-31 (Sample No. 1057).
		1931-32 (Sample No. 1356).
		1932-33 (Sample No. 1764).
		1933-34 (Sample No. 2245).
		1934-35 (Sample No. 2764).
		1935-36 (Sample No. 3129).
		1936-37 (Sample No. 3634).

I.—AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium hirsutum*.
- (ii) *History* :—A pure line strain isolated from a mixed crop of Cambodia cotton grown in 1920-21.
- (iii) *District of growth* :—Cambodia is grown generally in the Coimbatore District and in parts of Southern Madras (South Arcot, Chittoor, Salem, Coimbatore, Trichinopoly, Madura, Ramnad and Tinnevely districts); about half the crop is grown under irrigation. The particular samples used in these tests have been grown on the Farm of the Cotton Breeding Station, Coimbatore, excepting the 1935-36 sample which was supplied from the Central Farm, Coimbatore.
- (iv) *Growing period* :—September to April.
- (v) *Soil* :—Red loam.
- (vi) *Rainfall* :—25.34 inches (Average for 14 years—1923-24 to 1936-37).
- (vii) *Temperature* :—Minimum 60° F. in January and maximum 95° F. in March.
- (viii) *Plant particulars (average values)* :—
- (a) Bolls per plant : 3.2 (spacing : 30" × 9"). (Cotton Breeding Station 1935-36.)
- (b) Seeds per boll : 35.
- (c) Weight of seed : 134 milligrammes.
- (d) Weight of lint per seed : 73 milligrammes.
- (e) Ginning percentage : 35.
- (ix) *Yield of seed-cotton* :—890 lbs. per acre at Cotton Breeding Station, Coimbatore.
- (x) *Area under cultivation* :—

1928-29 ..	120 acres.	1933-34 ..	47,000 acres.
1929-30 ..	1,500 "	1934-35 ..	71,870 "
1930-31 ..	8,000 "	1935-36 ..	1,38,120 "
1931-32 ..	40,000 "	1936-37 ..	1,90,000 "
1932-33 ..	42,000 "		

II.—GRADER'S REPORT.

	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under.	Cambodia.	Cambodia.	F. G. Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach A/M.	Broach.
Class	Superfine.	Fine.	Superfine.	Fine.	Superfine.	Barely fine.	Fine.	Fine.	Fine.	Fine to S. F.	Superfine.	Fully good.
Colour	Slightly creamy.	White.	Creamy.	Creamy.	White.	Slight cream.	Creamy.	White.	Creamy.	Dull white	Creamy.	Dull white, spotted.
Staple Length ..	1-1½ inch.	1½ inch.	1-1 inch.	1½-1 inch.	1½ inch.	1 7/8 inch.	1 inch.	1 inch.	1½ inch.	Barely 1 in.	1 inch.	29/32 inch.
Staple Strength ..	Good.	Good.	Fair.	Good.	Good.	Good.	Fair.	Fair.	Fair.	Fair.	Good.	Good.
Regularity	Irregular.	Good.	Irregular.	Good.	Good.	Fair.	Fair.	Fair.	Fair.	Poor.	Regular.	Regular.
Value above or below contract rate .. ..	..	Rs. 15 on.	Rs. 100 to 110 on.	Rs. 65 on.	Rs. 65 on.	Rs. 65 on.	Rs. 50 on.	Rs. 20 on.	Rs. 40 on.	Rs. 45 on.	Rs. 45 on.	Rs. 50 on.
Basis .. ..	..	Rs. 400.	Rs. 368.	Rs. 323.	Rs. 250.	Rs. 175.	Rs. 155.	Rs. 203.	Rs. 190.	Rs. 232.	Rs. 197.	Rs. 240.
Date of Valuation ..	..	..	..	8-5-29.	16-4-30.	30-5-31.	7-6-32.	16-5-33.	30-4-34.	3-7-35.	8-4-36.	4-6-37.
Remarks	Rather rough.	..	..	..	..	..	..	..	Harsh.	..	..	..

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter):—													
Mean group-length in eighths of an inch.	Percentage.												
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.4	1.0	..	0.7	0.4	0.5	..	..	0.5	0.9	0.9	1.8	0.6
3	1.7	2.1	1.6	2.8	2.2	1.8	2.4	2.4	1.4	2.8	2.1	2.1	2.0
4	3.1	3.5	2.9	4.4	3.8	3.7	3.8	4.2	3.1	4.9	3.6	4.7	3.5
5	5.4	6.2	4.5	6.9	7.5	6.9	6.6	7.1	6.1	8.9	6.8	8.1	6.5
6	9.4	10.7	9.0	12.2	11.1	13.7	11.7	13.3	12.3	13.8	11.9	16.2	12.0
7	21.0	21.6	24.7	22.3	19.8	26.8	22.2	25.9	21.2	23.8	21.7	27.8	22.1
8	37.9	34.2	34.0	29.5	32.7	29.4	31.2	30.2	30.1	28.7	28.8	28.6	30.2
9	17.5	16.6	17.7	15.2	19.0	18.5	16.4	13.3	20.2	13.3	17.0	10.0	18.2
10	8.3	3.4	5.0	0.0	3.5	8.3	5.7	3.6	4.9	2.9	5.5	2.2	4.3
11	0.3	0.6	0.6	..	..	0.4	..	..	0.2	..	..	2.0	0.6
12	..	..	..	..	..	..	..	..	..	..	0.2	..	..
2. Fibre-Length (inch)—													
(a) By Balls Sorter ..	0.93	0.92	0.94	0.90	0.91	0.90	0.92	0.90	0.93	0.88	0.92	0.87	0.92
(b) By Baer Sorter ..	0.90	0.92	0.94	0.87	0.93	0.89	0.93	0.91	0.92	0.88	0.92	0.89	0.92
3. Fibre-Length Irregularity (%)													
(a) By Balls Sorter ..	..	..	..	..	..	17.0	10.7	18.6	18.7	22.5	19.4	19.4	19.7
(b) By Baer Sorter ..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Fibre-Weight per inch (millionth of an ounce)													
(a) By Balls Sorter ..	0.172	..	0.163	0.141	0.148	0.136	0.133	0.145	0.123	0.122	0.132	0.152	0.136
(b) By Baer Sorter ..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Fibre-Strength (oz.)—													
(a) By Balls Tester ..	..	..	..	0.128	0.096	0.116	0.116	0.113	0.091	0.095	0.120	0.121	0.117
(b) By O'Neill Tester ..	..	..	..	0.118	0.103	0.131	0.117	0.120	0.101	0.100	0.138	0.120	0.135
6. Fibre-Strength per unit fibre-weight per inch													
(a) By Balls Tester ..	..	..	..	0.87	0.67	0.91	0.88	0.80	0.78	0.80	0.96	0.81	0.93
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
7. Fibre-Rigidity (millionth of an ounce, square-inch)													
(a) By Balls Tester ..	..	..	..	0.138	0.090	0.224	0.145	0.148	..	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch)													
(a) By Balls Tester ..	..	..	..	0.62	0.61	0.64	0.66	0.63	0.68	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
9. Convolutions per inch													
(a) By Balls Tester ..	..	..	..	108	90	116	94	87	119	..	..	..	..
(b) By O'Neill Tester ..	..	..	..	..	..	..	..	..	..	..	..	..	..
10. Maturity Test Results (%)—													
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	40	46	50
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	15	27	21
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	45	27	29

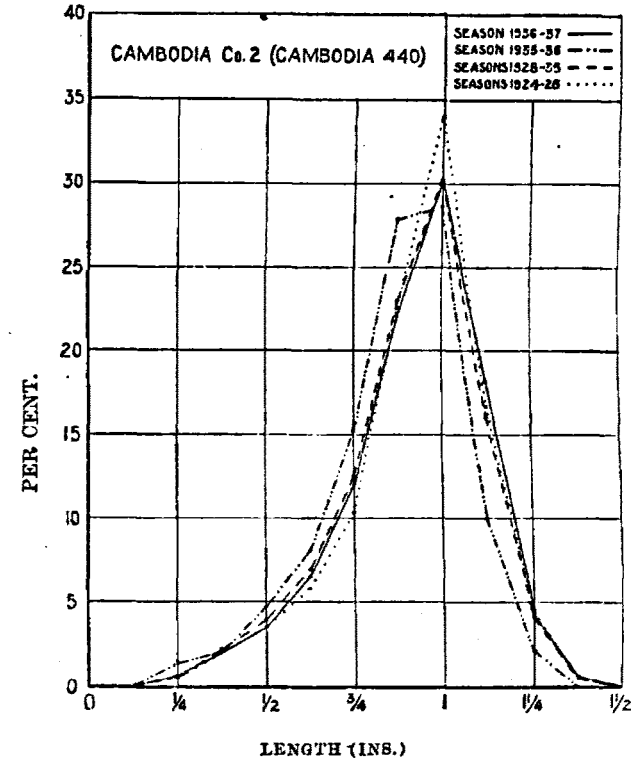


FIG. 16.—Sorter Diagrams for Cambodia Co. 2 (Cambodia 440).

IV.—SPINNING TESTS.

1. *Treatment* :—

- (a) *Blow-room*.—1924-25:—Lattice Feeder, Crighton (once), Hopper, Scutcher (3 times). 1925-26 to 1927-28 (inclusive):—Same as above but not passed through Lattice Feeder. 1928-29 and 1929-30 (inclusive):—Same as for 1924-25. 1930-31 to 1933-34 (inclusive):—Same as above but two passages through Crighton. 1934-35 onwards:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).
- (b) *Card-room*:—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover, and spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37:—Same as above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1924-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy; bright.	Creamy-white to creamy; bright.	Creamy-white to creamy.	Creamy-white; bright.	Creamy.	Creamy-white.	Creamy-white to creamy.	Creamy-white; fairly bright.	White to creamy-white.	White to creamy-white; bright.	Creamy-white.
Cleanliness ..	Clean.	Clean.	Very clean.	Perfectly clean.	Fairly clean.	Clean.	Fairly clean.	Clean.	Fairly clean.	Clean.	Clean.
Feel	Nice.	Silky; good.	Good.	Very good.	Good-soft.	Soft.	Light soft.	Good.	Fairly clean.	Good bodied.	Good bodied.
Ginning and nep-piness.	Well-ginned.	Well-ginned.	Well-ginned except for being a little knotty.	Well-ginned except for knottiness of the lint.	Well-ginned.	Somewhat knotted.	Well-ginned apart from a slight knottiness of material.	Well-ginned.	A little knotted.	Well-ginned.	Well-ginned.
Seeds .. ..	..	..	..	A little cut seeds.	..	..	..	..	..	..	..
Card sliver ..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean.	Good and clean.
Card-web ..	..	..	..	..	A trifle neppy.	Fairly good.	Good.	Even.	Somewhat neppy.	Even and nep-free.	Good and nep-free.
Weight of ten flat strips.	..	..	..	..	15.3 grams.	18.0 grams.	18.0 grams.	17.6 grams.	22.7 grams.	11.5 grams.	16.8 grams.
Remarks ..	Staple regular; fairly hard.	Cotton similar to Cambodia 295.	Fine and regular staple; a very good sample.	Staple fine, regular in length and of good strength; a very desirable cotton.	..	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 16 on page 80.

V.—REMARKS.

(i) *Fibre*.—The mean fibre-length and fibre-length irregularity did not show much seasonal variation till 1931-32. Since then the former has been high and low in alternate years and the latter generally on the high side. The mean fibre-weight per inch is rather high in 1924-25, 1926-27 and 1935-36 but low in two seasons 1932-34. The fibre-strength and the fibre-strength per unit fibre-weight per inch are variable, the former being unusually low in 1928-29, 1932-33 and 1933-34 and the latter in 1928-29. The fibre-rigidity is much more variable, being twice as high in 1929-30 as in 1928-29. The 1936-37 sample is longer, finer and intrinsically stronger than its immediate predecessor, and resembles the 1934-35 sample in fibre-properties.

(ii) *Waste*.—Samples of this cotton are generally quite clean, those received since 1930-31, however, are somewhat dirtier than the earlier ones. Its card-room loss is generally on the high side, lying usually in the neighbourhood of 9 per cent.

(iii) *Breakages*.—Yarn-breakages in the ring frame are usually few in 20's and 30's but fairly numerous in 34's counts. They were, however, fairly numerous in 30's and numerous in 34's counts of the 1932-33 cotton.

(iv) *Yarns*.—This cotton usually gives even 20's and even to fairly even or fairly even 30's, the 1935-36 yarns being rather more even than the average. Its yarns are inclined to be neppy, though a distinct improvement is noticeable since 1934-35, which has been maintained upto the present. The yarn strength results vary considerably with the season, being good in 1927-28 and 1936-37, better still in 1926-27 and poor in 1925-26 and 1932-33.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is suitable in the different seasons :—

1924-25	29's.	1929-30	28's.	1933-34	26's.
1925-26	25's.	1930-31	29's.	1934-35	30's.
1926-27	37's.	1931-32	27's.	1935-36	30's.
1927-28	33's.	1932-33	24's.	1936-37	33's.
1928-29	26's.				

TABLE 16.—SPINNING TEST RESULTS FOR CAMBODIA Co. 2 (CAMBODIA 440).

HANK (1936-37).				TRAVELLER COUNTS.													SPINDLE SPEED (1936-37).														
Card	0.18	20s	3/0	20A	9,375 r.p.m.																										
Slubber	0.78	30s	7/0	20B	10,200 r.p.m.																										
Inter	1.74	34s	9/0	30	9,550 r.p.m.																										
Rover	4.70			34	9,550 r.p.m.																										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.													TEMPERATURE (°.)		RELATIVE HUMIDITY (F).				
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R.P.M.	Draft.	Turns per Inch.	LEA.				BALLISTIC.				SINGLE THREAD.					Spinning Room.	Spinning Room.	Testing Room.				
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Counts-Strength Product.	Counts Actual.	Work of Rupture (inch.-lb.)	Work Irregularity (%).	Count-Work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.	Extension (%).				Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
505	1924-28	30-4-29	20A	2.2	9.5	0.6	12.4	21	187	4.31	16.85	19.6	85.8	5.9	1,682	..	..	..	20.0	11.7	9.1	1.4	6.1	6.3	2	6.3	16.2	88	70	69
706	1924-29	4-4-30	"	4.2	9.5	0.4	14.1	10	191	4.44	16.85	19.4	75.3	4.9	1,401	19.8	110.5	..	20.0	11.7	9.1	1.4	6.1	6.3	2	6.3	16.1	86	66	71	
1057	1929-30	4-4-30	"	2.8	7.2	0.2	10.1	0	191	5.06	16.85	20.0	79.4	4.6	1,588	20.1	122.6	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.2	86	66	67	
1356	1930-31	25-5-31	"	8.9	8.8	0.4	14.5	9	200	4.68	16.85	20.0	77.8	3.6	1,576	20.2	121.3	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.2	82	63	68	
1764	1931-32	9-6-32	"	5.9	10.0	0.6	15.8	28	198	4.80	16.85	20.0	73.8	4.5	1,479	20.4	121.3	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.4	81	64	67	
2245	1932-33	10-5-33	"	6.4	10.0	0.6	16.2	28	200	4.45	16.85	20.0	71.0	3.4	1,429	20.1	117.1	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.1	89	64	70	
2764	1933-34	27-4-34	"	4.4	9.4	0.4	13.2	16	202	4.34	16.85	19.8	74.4	4.3	1,473	19.8	117.0	..	20.0	11.7	9.1	1.4	6.1	6.3	4	6.3	16.0	85	67	69	
3129	1934-35	1-7-35	"	6.2	11.4	0.3	17.2	0	192	4.55	16.85	19.5	92.4	4.0	1,802	19.6	158.2	..	20.0	11.7	9.1	1.4	6.1	6.3	4	6.3	16.0	87	76	72	
3634/1	1935-36	28-3-36	"	4.4	7.6	0.3	11.8	5	202	4.66	16.85	19.8	87.5	3.6	1,732	20.2	130.6	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.2	89	65	72	
3634/2	1936-37	31-5-37	"	6.6	9.8	0.3	16.0	10	204	4.44	16.85	19.9	86.9	3.9	1,729	19.6	138.4	..	20.0	11.7	9.1	1.4	6.1	6.3	3	6.3	16.0	90	67	67	
706	1929-30	4-4-30	20B	..	..	..	..	2	191	4.94	17.98	19.8	83.8	4.0	1,659	20.0	128.0	..	20.0	11.7	8.6	0.5	8.1	6.4	3	3.6	17.8	88	62	65
1057	1930-31	26-5-31	"	..	..	..	..	6	198	4.64	17.98	19.6	84.1	4.0	1,648	19.9	130.5	..	20.0	11.7	8.2	0.5	8.3	7.5	3	3.6	17.4	91	65	70
1356	1931-32	9-6-32	"	..	..	..	..	16	194	4.76	17.98	19.9	79.6	4.9	1,584	20.0	130.8	..	20.0	11.7	8.4	1.2	7.6	6.6	3	8.9	17.4	91	68	68
1764	1932-33	10-5-33	"	..	..	..	..	18	197	4.45	17.98	19.9	74.5	3.4	1,483	20.0	122.1	..	20.0	11.7	8.2	0.5	7.8	7.2	4	4.5	17.2	89	67	69
2245	1933-34	27-4-34	"	..	..	..	..	13	198	4.41	17.98	19.8	77.2	3.8	1,529	20.0	120.3	..	20.0	11.7	9.9	2.2	7.0	8.4	4	3.8	17.2	88	68	68
2764	1934-35	1-7-35	"	..	..	..	..	0	198	4.65	17.98	19.4	94.0	4.4	1,824	19.7	164.5	..	20.0	11.7	9.8	2.0	8.0	8.5	2	4.0	17.0	86	76	74
3129	1935-36	23-3-36	"	..	..	..	..	0	204	4.96	17.98	19.9	91.0	4.2	1,824	20.0	134.6	..	20.0	11.7	8.4	0.5	7.4	8.1	3	1.4	17.2	87	67	72
3634/1	1936-37	31-5-37	"	..	..	..	..	5	210	4.53	17.98	20.3	87.1	2.0	1,768	19.9	158.8	..	20.0	11.7	8.3	1.0	7.8	5.6	3	2.0	17.0	90	68	67
3634/2	1936-37	1-6-37	"	..	..	..	..	0	209	4.41	17.98	19.8	89.1	4.9	1,764	20.0	139.4	..	20.0	11.7	8.6	1.0	7.4	9.5	3	1.5	17.1	90	68	66
505	1924-28	30-4-29	30	..	..	..	..	8	151	6.62	21.86	29.6	49.9	6.0	1,477	..	..	..	30.2	7.2	10.7	1.5	5.7	9.0	3	5.4	21.3	88	70	69
706	1924-29	4-4-30	"	..	..	..	..	26	158	6.67	21.86	29.5	43.5	5.1	1,283	29.8	63.0	..	5.0	7.2	4.2	5.7	10.6	5	7.7	20.8	91	66	68	
1057	1929-30	5-4-30	"	12	159	7.31	21.86	29.7	46.5	5.0	1,381	29.8	80.8	..	2.9	30.4	6.3	11.5	2.5	7.0	7.8	5	3.3	21.0	88	62	65
1356	1930-31	26-5-31	"	12	163	7.02	21.86	30.0	47.2	5.0	1,416	30.6	82.1	..	2.6	30.4	6.6	11.6	3.5	6.8	10.1	5	6.4	21.2	91	66	69
1764	1931-32	10-6-32	"	14	160	7.22	21.86	29.7	45.2	4.6	1,342	30.2	81.0	..	2.9	30.8	6.3	11.1	3.2	6.6	9.7	4	4.6	21.2	91	66	71
2245	1932-33	10-5-33	"	37	160	6.64	21.86	30.1	41.8	5.3	1,258	29.8	79.1	..	3.0	30.0	6.2	12.9	6.8	6.8	12.2	5	4.4	21.2	89	68	70
2764	1933-34	27-4-34	"	24	162	6.42	21.86	29.0	47.8	4.5	1,366	28.6	83.5	..	2.9	30.6	6.9	11.6	5.2	6.2	8.6	5	3.8	21.2	88	69	70
3129	1934-35	1-7-35	"	4	164	6.97	21.86	29.8	52.2	5.1	1,556	30.0	91.2	..	3.6	30.4	7.6	12.4	4.2	6.9	9.9	4	4.0	20.8	86	78	75
3634/1	1935-36	30-3-36	"	5	158	7.00	21.86	30.2	51.8	4.2	1,564	30.1	86.8	..	2.4	31.0	7.1	12.0	3.8	6.2	8.4	4	1.9	21.0	89	63	72
3634/2	1936-37	31-5-37	"	3	158	6.71	21.86	30.0	52.2	4.7	1,566	29.2	87.2	..	2.0	30.6	8.1	7.0	10.5	8.5	7.0	4	1.5	20.6	91	67	66
505	1924-25	7-8-25	34	..	..	..	..	10	130	5.49	23.70	33.0	39.7	9.8	1,310	..	..	..	40.9	5.1	11.9	5.7	4.6	10.0	4	3.4	20.1	88	72	70
706	1924-29	1-5-29	"	34	147	7.58	23.26	33.5	35.9	4.6	1,293	33.8	52.6	..	4.3	34.4	4.9	12.6	4.0	4.1	4.3	..	7.4	22.4	91	67	70
1057	1929-30	4-4-30	"	10	148	8.33	23.26	33.6	39.2	5.1	1,317	34.0	69.6	..	3.6	34.9	5.5	11.5	2.7	6.7	8.4	5	8.7	22.2	86	63	66
1356	1930-31	26-5-31	"	13	144	8.02	23.26	34.4	38.0	4.8	1,307	35.1	71.1	..	3.3	34.6	5.6	12.6	3.0	6.2	12.8	6	6.1	22.4	91	68	68
1764	1931-32	11-6-32	"	39	144	8.25	23.26	34.2	36.5	4.4	1,248	34.4	71.3	..	2.8	34.5	5.6	13.1	6.8	6.2	11.2	5	4.0	22.8	91	66	70
2245	1932-33	11-5-33	"	59	146	7.46	23.26	33.4	35.5	5.0	1,186	33.4	71.2	..	3.2	33.7	5.1	15.6	7.8	6.2	12.4	6	4.5	22.4	89	68	70
2764	1933-34	27-4-34	"	15	147	7.34	23.26	33.6	37.0	5.2	1,243	33.6	70.8	..	2.9	34.2	5.0	16.7	4.2	5.6	12.8	5	4.0	22.3	88	68	70
3129	1934-35	2-7-35	"	15	146	7.89	23.26	34.2	41.8	5.2	1,439	34.0	89.3	..	1.8	34.3	6.2	12.9	4.2	5.6	10.2	5	3.6	22.0	86	74	76
3634/1	1935-36	30-3-36	"	12	148	7.83	23.26	33.9	42.2	5.8	1,431	34.0	75.7	..	3.0	34.7	6.0	12.6	4.5	5.8	11.7	4	1.8	22.4	89	65	72
3634/2																															

17.—NANDYAL 14 (Northern).)

Seasons.		Seasons.		Seasons.	
1923-24 (Sample No. 73).	1928-29 (Sample No. 506).	1933-34 (Sample No. 2246).			
1924-25 (Sample No. 74).	1929-30 (Sample No. 726).	1934-35 (Sample No. 2767).			
1925-26 (Sample No. 162).	1930-31 (Sample No. 1044).	1935-36 (Sample No. 3175).			
1926-27 (Sample No. 273).	1931-32 (Sample No. 1334).	1936-37 (Sample No. 3568).			
1927-28 (Sample No. 378).	1932-33 (Sample No. 1808).				

I.—AGRICULTURAL DETAILS.

- (i) *Botanical Species* :—*Gossypium indicum*.
- (ii) *History* :—From the commercial type known as "White Northern," selection work was begun at Nandyal in 1907-08; comparative trials were started in 1914-15, and general distribution of Nandyal 14 began in 1918.
- (iii) *District of growth* :—Nandyal (Kurnool district). The particular samples used in these tests have been grown at the Agricultural Research station, Nandyal.
- (iv) *Growing period* :—Usually sown from the middle to the end of August, and picked from January to April. The sowing season in 1932-33 was late by three to four weeks. The earlier sowings in 1933-34 just preceded heavy downpour of rain resulting in the total failure of germination and sowings had to be done again. In 1934-35, sowings were done in right time and the rains were well distributed during the period of growth; in 1935-36, sowings were delayed by two weeks due to heavy rains in August and first week of September; the sowing season was normal (3rd week of August) in 1936-37.
- (v) *Soil* :—Stiff black cotton soil, slightly alkaline at Nandyal; but seed is distributed for red and mixed soils of clay loams, for which it is better suited.
- (vi) *Rainfall* :—25-30 inches annually; a little over 20 inches in 1929-30, but well distributed so that the total return per acre was almost a record figure. The average rainfall in 1930-31 was also 29 inches but rains for sowing the crop and those during the north-east monsoon period were so ill-distributed that cotton cultivation during the year was of the nature of a gamble. During 1931-32, about 31 inches. About 22 inches in 1932-33. This deficiency was mostly due to poor showers during the south-west monsoon period. The general cotton yield was however satisfactory. About 33 inches in 1933-34. The excess was due to heavy showers in the south-west monsoon. The general yield was not quite satisfactory. 27" in 1934-35, was well distributed and was ideal for cotton; the yields were good. 31.5" in 1935-36; only 23 inches in 1936-37.
- (vii) *Temperature* :—
Mean Minimum: 69°F.; Range: 52°F.—94°F.
" Maximum: 94°F.; Range: 76°F.—112°F.
- (viii) *Plant particulars (average values)* :—
(a) Bolls per plant: 27 (spacing: 18" x 9").
(b) Seeds per boll: 21.
(c) Weight of seed: 46 milligrammes.
(d) Weight of lint per seed: 14 milligrammes.
(e) Ginning percentage: 23.
- (ix) *Yield of seed-cotton* :—200 lbs. per acre in 1928-29, 568 lbs. during 1929-30 (rainfall distribution ideal), 273 lbs. in 1930-31 and 252 lbs. in 1931-32. In the bulk field, the yield per acre was 186 lbs. in 1931-32, 243 lbs. in the Farm and 216 lbs. in the bulk field per acre during 1932-33. In 1933-34, the yield was 170 lbs. only due to abnormal rainfall, red leaf disease and poor germination; 340 lbs. in 1934-35; 180 lbs. in 1935-36 in the Farm; 250 lbs. in 1936-37.

(x) *Area under cultivation* :—

1923-24 .. 20,550 acres.	1927-28 .. 11,000 acres.	1931-32 .. 27,800 acres.	1935-36 .. 2,300 acres.
1924-25 .. 20,180 "	1928-29 .. 23,600 "	1932-33 .. 10,550 "	1936-37 .. 3,925 "
1925-26 .. 12,700 "	1929-30 .. 27,300 "	1933-34 .. 3,300 "	
1926-27 .. 17,730 "	1930-31 .. 29,500 "	1934-35 .. 5,500 "	

II.—GRADER'S REPORT.

	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract valued under ..	Cambodia.	Cambodia.	Cambodia.	Northern.	F. G. Broach.	Broach.	Kumpta.	Broach.	Broach/Western.	Broach.	Broach.	Broach.	Broach/July.	Broach/A.M.
Class ..	Fine.	F. G. to Fine.	Fine to Superfine.	Extra Superfine.	Superfine.	Fine.	Extra Superfine.	Superfine.	Superfine.	Fine.	Superfine.	Superfine.	Superfine.	Fully good to fine.
Colour ..	Creamy.	Creamy.	Slightly creamy.	White.	White.	White.	White.	Reddish.	White.	White.	White.	White.	White.	Greyish.
Staple Length ..	15/16 inch.	7/8-15/16"	7/8-1 inch.	1 inch.	1 inch.	7/8-1 in.	1 1/4 in.	15/16 in.	One in.	31/32 in.	15/16 in.	Full 7/8 in.	15/16 in.	13/16 inch.
Staple Strength ..	Good.	Good.	Good.	Good.	Good.	Good.	Fair.	Fair.	Fair.	Fair.	Fair.	Very good.	Good.	Good.
Regularity ..	Regular.	..	..	Good.	Regular.	Fair.	Fair.	Fair.	Fair.	Fair.	Irregular.	Regular.	Regular.	Somewhat neppy and irregular.
Value above or below contract rate ..	..	..	..	Rs. 40 on.	Rs. 50 on.	Rs. 60 on.	Rs. 30 on.	Rs. 50 on.	Rs. 50 on.	Rs. 45 on.	Rs. 60 on.	Rs. 70 on.	Rs. 45 on.	Rs. 30 on.
Basis ..	..	..	..	Rs. 335.	Rs. 385.	Rs. 323.	Rs. 300.	Rs. 190.	Rs. 166.	Rs. 214.	Rs. 190.	Rs. 237.	Rs. 199.	Rs. 227.
Date of Valuation ..	..	..	..	..	7-5-28.	8-5-29.	24-5-30.	11-5-31.	16-5-32.	5-7-33.	30-4-34.	1-7-35.	23-5-36.	1-5-37.
Remarks ..	..	..	Silky.	..	..	..	..	..	..	..	..	..	Somewhat wasty.	Somewhat badly ginned.

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.													
	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	0.1	..	..	..	0.5	0.1	0.5	..	0.4	0.2	0.2	0.1	0.4	0.5
3	1.3	1.5	1.5	1.2	2.1	1.1	1.3	2.0	2.5	1.1	1.7	1.8	1.8	1.8
4	2.9	3.0	3.2	2.7	4.4	2.4	2.6	4.1	4.5	2.6	2.7	2.1	2.7	4.2
5	6.2	6.6	6.8	5.4	8.0	5.7	6.0	9.0	9.3	4.7	6.5	4.6	6.0	9.0
6	12.0	12.9	13.1	9.6	14.0	10.2	12.0	18.6	18.2	12.0	15.4	9.8	13.0	17.8
7	26.5	32.2	27.4	22.1	23.5	22.1	24.8	35.3	32.1	28.1	31.2	22.7	25.8	30.8
8	37.4	32.7	33.9	34.8	33.5	36.7	33.7	24.8	24.5	34.4	31.2	34.4	32.5	27.2
9	12.6	9.6	11.6	20.8	11.9	18.7	13.1	5.6	6.9	14.5	9.7	21.0	14.2	7.6
10	1.0	1.5	2.5	3.4	2.1	2.9	4.4	0.6	1.6	2.4	1.4	3.7	3.5	1.4
11	..	..	..	..	..	0.1	1.6	..	..	..	..	0.3	0.6	0.2
2. Fibre-Length (inch)—														
(a) By Balls Sorter ..	0.90	0.89	0.90	0.94	0.89	0.93	0.92	0.85	0.85	0.92	0.89	0.95	0.92	0.86
(b) By Baer Sorter ..	0.91	0.89	0.87	0.93	0.87	0.90	0.91	0.83	0.85	0.90	0.89	0.93	0.91	0.87
3. Fibre-Length Irregularity (%) ..														
..	..	..	..	..	..	..	15.9	14.7	16.4	13.6	13.6	14.2	16.0	16.1
4. Fibre-Weight per inch (millionth of an ounce)														
..	0.198	0.179	0.176	0.191	0.196	0.187	0.169	0.167	0.137	0.156	0.163	0.171	0.153	0.163
5. Fibre-Strength (oz.)—														
(a) By Balls Tester ..	..	..	..	0.251	0.226	0.226	0.234	0.206	0.230	0.215	0.220	0.214	0.202	0.223
(b) By O'Neill Tester ..	..	..	..	0.195	0.233	0.247	0.231	0.213	0.223	0.229	0.223	0.236	0.222	0.229
6. Fibre-Strength per unit fibre-weight per inch														
..	..	..	..	1.17	1.17	1.26	1.38	1.25	1.21	1.42	1.36	1.32	1.39	1.39
7. Fibre-Rigidity (millionth of an ounce, square-inch) ..														
..	..	..	..	0.142	0.147	0.169	0.169	0.137	0.160	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch) ..														
..	0.74	0.66	0.70	0.61	0.67	0.65	0.65	0.67	0.64	0.67	..	..	..	..
9. Convolutions per inch														
..	86	83	88	46	56	60	70	67	60	80	..	..	..	..
10. Maturity Test Results (%)—														
(a) Mature ..	..	..	..	..	..	..	..	..	..	..	..	64	64	76
(b) Half-mature ..	..	..	..	..	..	..	..	..	..	..	..	23	22	11
(c) Immature ..	..	..	..	..	..	..	..	..	..	..	..	13	14	13

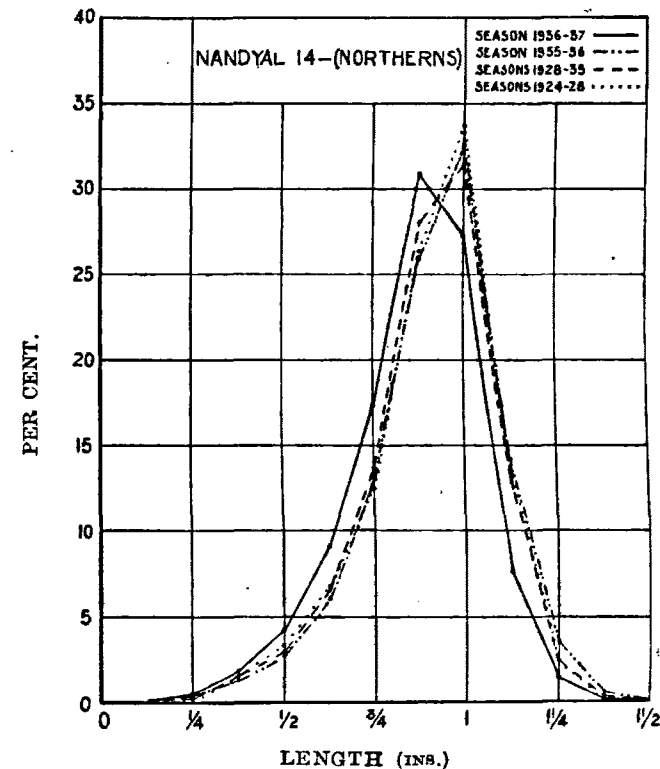


Fig. 17.—Sorter Diagrams for Nandyal 14—(Northern).

IV. SPINNING TESTS.

1. Treatment :—

(a) *Blow-room*—1923-24, 1924-25, 1926-27 (second lot), 1932-33 and 1933-34 cottons :— Lattice Feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1925-26 cotton and the first lot of 1926-27 cotton were passed direct through the Crighton (twice); in other seasons, these cottons were passed through the Lattice Feeder but once only through the Crighton. 1934-35 onwards :—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room* :—Upto 1934-35 (inclusive) :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1. 1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3, which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report :—

Season.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour ..	Creamy to creamy-white.	Creamy-white; bright.	Creamy-white to creamy; bright.	White to creamy-white; very bright.	White; very bright.	Creamy-white; bright.	White to creamy-white; bright.	White to creamy-white.	White.	White.	White; brightish.	White to creamy-white.
Cleanliness ..	Leafy.	Clean.	Clean.	Perfectly clean.	Perfectly clean.	Very clean.	Very clean.	Clean.	Very clean.	Clean.	Clean.	Fairly clean.
Feel	Too soft.	Silky.	Soft and bodied.	Full-bodied.	Good soft feel with plenty of cling.	Good soft.	Good soft.	Good soft.	Good.	Good.	Good bodied.	Good soft.
Ginning and neppiness ..	Gin nep and unripe stuff present.	..	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Somewhat knotted.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds	Very seedy indeed with cut seed.	Very seedy (3 per cent.)	One per cent. mostly cut seed present.	..	Few partly ginned seeds present.	Some cut and partly ginned seeds present.	..	..	..	..	..	..
Card-silver ..	..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean.	Good.
Card-web ..	Very neppy.	..	..	..	..	Very good.	Good.	Good.	Even; nep-free.	..	Even and nep-free.	Good.
Weight of ten flat strips ..	..	..	..	..	..	13.7 grams.	13.7 grams.	18.4 grams.	14.6 grams.	19.7 grams.	11.7 grams.	12.5 grams.
Remarks ..	..	..	A good sample.	A very desirable sample in every respect.	Staple strong and regular in length, a very desirable cotton.	..	..	..	..	..	..	..

3. Spinning Test Details and Results :—See Table 17, page 84.

V. REMARKS.

(i) *Fibre*.—With very few exceptions the fibre-properties of this cotton show remarkably little variation in the different seasons. The mean fibre-length is rather low in the two seasons, 1930-32 and in 1936-37 and higher than the average in 1934-35. The fibre-weight is low in 1932-33 and again in 1935-36. The ribbon-width and the number of convolutions per inch are unusually low in 1926-27. The 1932-33 and 1933-34 cottons are somewhat more regular in staple than the others. The 1936-37 cotton is shorter and somewhat coarser but stronger than its predecessor; it also possesses a higher percentage of mature fibres.

(ii) *Waste*.—Samples of this cotton have shown considerable improvement in cleanliness since 1928-29. The card-room loss does not vary much, lying generally in the neighbourhood of 8 per cent. though it was a little higher for the 1932-33 and the 1934-35 samples.

(iii) *Breakages*.—Yarn breakages in the ring frame are fairly numerous in 20's and 30's counts and occasionally numerous in 34's counts. The 1936-37 sample, however, gave few breakages in all the counts into which it was spun.

(iv) *Yarns*.—Yarns spun from this cotton have given variable results as regards evenness and neppiness in the different seasons. Usually they are very even to even in 20's and even to fairly even in 30's, but those of 1930-31, 1931-32, 1934-35 and 1935-36 seasons are not so even. They are inclined to be neppy, those of 1928-29 and 1930-31 being poorer than the others in this respect. The yarn-strength results did not show much variation till 1931-32 but since then a good improvement is noticeable which is maintained upto the current season.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1923-24 ..	34's.	1928-29 ..	31's.	1933-34 ..	37's.
1924-25 ..	32's.	1929-30 ..	35's.	1934-35 ..	40's.
1925-26 ..	32's.	1930-31 ..	35's.	1935-36 ..	40's.
1926-27 ..	34's.	1931-32 ..	30's.	1936-37 ..	42's.
1927-28 ..	31's.	1932-33 ..	37's.		

TABLE 17.—SPINNING TEST RESULTS FOR NANDYAL 14 (NORTHERNS).

HANK (1936-37).
 Card 0.14
 Slubber 0.74
 Inter 1.69
 Rover 4.65

TRAVELLER COUNTS

20 3/0
 30 7/0
 40 12/0

SPINDLE SPEED (1936-37)

20A 9,350 r.p.m.
 20B 10,150 r.p.m.
 30 9,450 r.p.m.
 40 9,400 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.						Spinning Room.	Spinning Room.	Testing Room.					
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%).	Count-work Product.	Counts.	Strength (oz.)	Strength Irregularity (%).	Weakness Percentage.					Extension (%).	Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
506	1933-28 1924-29	2-5-29	20A	7.7 4.8	8.4 8.0	0.7 0.3	16.0 12.7	20 17	184 192	4.40 4.35	16.85 16.85	19.6 20.2	87.6 79.7	7.7 7.4	1,717 1,010	20.5	142.8	3.5	2,917	20.2 20.9	11.9 11.5	10.6 13.1	8.6 8.0	5.6 6.9	9.9 7.2	3 2	4.5 4.1	16.2 16.2	86 91	76 66	67 70	
726	1929-30	5-5-30	..	2.6	7.0	0.6	10.0	45	202	4.73	16.85	20.0	90.1	5.9	1,802	20.2	140.4	3.4	2,836	20.2	12.7	12.9	3.7	6.6	8.3	2	2.0	16.2	92	63	68	
1044	1930-31	5-5-31	..	5.3	7.6	0.4	13.0	45	107	4.44	16.85	19.8	91.7	5.8	1,816	20.2	145.4	3.4	2,937	20.2	11.5	12.0	3.8	6.3	8.2	2	4.1	16.2	91	66	69	
1334	1931-32	19-5-32	..	4.7	7.4	0.6	12.3	29	200	4.45	16.85	20.0	78.0	7.6	1,560	20.6	130.6	3.6	2,690	20.6	10.6	14.6	5.8	6.2	8.3	3	1.8	16.2	93	66	68	
1803	1932-33	20-6-33	..	4.8	9.0	0.4	13.6	34	200	4.34	16.85	10.4	109.2	5.8	2,118	19.4	178.5	4.4	3,424	19.6	14.4	9.4	2.2	7.4	6.9	2	2.1	16.1	88	70	78	
2246	1933-34	24-4-34	..	4.0	7.8	0.4	11.8	32	201	4.20	16.85	19.9	99.8	6.9	1,986	20.2	163.3	4.0	3,290	20.0	14.6	9.5	1.0	7.4	6.7	3	1.6	16.4	87	68	70	
2767	1934-35	12-7-35	..	3.5	9.8	0.4	13.3	26	194	4.30	16.85	20.2	103.8	6.0	2,097	20.2	166.5	5.1	3,363	20.4	14.0	11.2	2.5	7.4	7.8	3	2.5	16.1	87	74	74	
3175	1935-36	16-5-36	..	4.5	5.6	0.2	10.1	2	184	4.64	16.85	19.7	106.2	4.7	2,092	19.9	175.4	5.1	3,400	19.8	14.4	9.6	1.0	7.5	6.7	3	2.1	16.2	90	69	72	
3564 1	1936-37	5-5-37	..	5.3	6.8	0.3	12.0	2	203	4.51	16.85	19.4	118.0	4.6	2,239	19.2	201.8	4.0	3,875	20.2	13.9	9.5	1.5	6.7	5.4	3	2.8	16.1	90	69	74	
3564 2	1936-37	5-5-37	..	5.5	6.9	0.4	12.3	10	205	4.51	16.85	20.2	112.0	4.9	2,262	20.1	181.0	3.5	3,634	20.8	13.1	9.7	1.5	7.0	7.0	3	3.2	16.2	89	69	76	
726	1929-30	5-5-30	20B	..	..	..	..	2	200	4.73	17.98	19.8	105.5	4.9	2,089	20.0	147.6	4.5	2,952	20.6	13.3	9.5	1.5	6.7	7.0	2	1.8	17.3	92	61	62
1044	1930-31	5-5-31	..	..	..	..	..	34	194	4.44	17.98	19.8	103.8	5.0	2,056	20.0	158.7	4.7	3,174	20.1	13.5	11.6	2.5	6.6	7.0	3	4.4	17.3	90	68	70
1334	1931-32	19-5-32	..	..	..	..	..	18	194	4.54	17.98	20.0	95.1	5.7	1,922	20.1	144.9	3.8	2,912	20.7	12.2	12.0	4.5	6.6	8.4	3	1.9	17.4	93	66	66
1803	1932-33	20-6-33	..	..	..	..	..	29	196	4.39	17.98	19.6	117.0	4.2	2,293	19.7	178.6	4.8	3,518	20.4	14.3	9.3	1.5	7.6	6.8	2	1.8	17.2	89	67	79
2246	1933-34	24-4-34	..	..	..	..	..	10	199	4.26	17.98	19.6	113.4	4.8	2,223	19.8	177.5	4.6	3,514	20.0	15.2	9.8	1.2	7.4	7.4	2	1.6	17.4	89	68	70
2767	1934-35	13-7-35	..	..	..	..	..	24	199	4.30	17.98	20.0	117.4	4.2	2,348	20.0	183.5	4.5	3,670	20.5	15.4	9.4	1.2	7.4	9.0	3	3.0	17.3	86	75	74
3175	1935-36	18-5-36	..	..	..	..	..	0	193	4.74	17.98	20.0	111.9	4.2	2,238	20.0	184.3	4.0	3,686	20.6	14.6	9.0	1.8	7.4	6.6	3	2.2	17.2	90	67	78
3564 1	1936-37	1-5-37	..	..	..	..	..	0	208	4.41	17.98	20.1	118.4	4.4	2,380	20.1	187.6	5.8	3,771	20.6	14.4	9.8	1.0	6.8	5.4	3	3.5	17.4	89	68	75
3564 2	1936-37	5-5-37	..	..	..	..	..	16	209	4.51	17.98	19.9	117.9	3.8	2,346	19.5	196.4	3.6	3,830	20.6	15.6	10.1	0.5	7.3	8.1	3	2.8	17.2	89	68	76
506	1923-28 1924-29	2-5-29	30	..	..	..	..	15	149	6.61	21.86	29.4	62.6	7.6	1,546	..	80.6	..	2,466	30.4	7.7	12.4	5.0	5.0	11.9	5	4.7	21.2	85	76	67
726	1923-30	6-5-30	..	..	..	..	..	12	155	6.25	21.86	29.9	49.4	9.5	1,477	30.6	80.6	5.0	2,466	30.4	8.2	12.3	4.7	6.2	9.2	4	3.6	21.0	92	63	68
1044	1930-31	6-5-31	..	..	..	..	..	6	162	7.05	21.86	29.6	55.2	7.3	1,634	29.7	94.3	3.0	2,801	30.5	7.8	12.1	5.0	5.4	11.6	4	2.4	21.0	91	62	64
1334	1931-32	20-5-32	..	..	..	..	..	36	162	6.58	21.86	30.2	55.6	4.8	1,679	30.9	93.8	2.5	2,898	30.6	7.7	13.0	6.2	6.2	14.4	4	3.8	21.2	91	68	68
1803	1932-33	19-6-33	..	..	..	..	..	20	154	6.45	21.86	29.0	53.6	8.1	1,554	29.2	94.1	2.1	2,748	29.2	8.6	11.7	4.2	6.2	8.0	4	1.9	21.8	93	67	67
2246	1933-34	24-4-34	..	..	..	..	..	14	161	6.36	21.86	29.0	67.8	8.0	1,966	29.1	103.1	3.2	3,000	30.0	8.8	12.2	6.2	6.4	9.0	4	1.4	21.0	89	69	76
2767	1934-35	19-7-35	..	..	..	..	..	10	160	6.40	21.86	29.8	60.8	6.4	1,812	29.7	98.7	3.0	2,931	30.8	8.7	12.0	4.0	6.2	9.7	4	2.0	21.2	88	69	68
3175	1935-36	15-5-36	..	..	..	..	..	4	100	6.49	21.86	29.8	65.1	6.6	1,940	30.0	99.0	3.8	2,988	30.9	9.1	13.6	6.0	6.4	10.7	4	3.2	21.1	87	74	72
3564 1	1936-37	4-5-37	..	..	..	..	..	10	161	6.74	21.86	29.8	64.6	5.6	1,925	29.3	102.3	2.5	3,049	30.4	9.0	13.0	4.2	6.8	8.8	4	2.1	21.2	90	67	70
3564 2	1936-37	6-5-37	..	..	..	..	..	13	158	6.82	21.86	29.4	71.0	5.7	2,087	28.9	106.4	3.3	3,075	29.5	9.7	10.9	1.5	6.1	9.3	4	4.0	21.0	90	69	75
3564 2	1936-37	6-5-37	..	..	..	..	..	10	159	6.82	21.86	29.8	68.4	4.6	2,038	30.1	102.8	2.9	3,094	30.9	9.8	12.7	4.0	6.3	9.2	5	3.5	21.0	89	67	79
374	1927-28	30-4-28	34	..	..	..	..	23	143	7.73	23.20	33.5	40.4	10.4	1,353	..	..	..	..	34.4	6.3	16.6	10.5	5.4	12.7	5	5.2	22.5	91	70	69
506	1924-29	3-5-29	..	..	..	..	..	33	147	7.11	23.26	33.6	41.6	8.5	1,398	33.3	71.3	4.4	2,374	34.2	6.9	12.6	4.5	5.8	10.8	5	4.6	22.4	92	67	69
726	1929-30	6-5-30	..	..	..	..	..	20	148	7.81	23.26	32.8	47.9	7.7	1,571	33.7	82.7	3.4	2,787	33.5	7.1	13.4	5.7	6.1	12.9	5	2.7	22.5	92	63	63
1044	1930-31	7-5-31	..	..	..	..	..	33	146	7.30	23.26	33.6	46.4	6.3	1,550	34.4	83.8	2.7	2,883	34.0	6.6	15.2	8.8	4.8	17.6	5	4.1	22.4	91	70	70
1334	1931-32	21-5-32	..	..	..	..	..	64	136	7.60	23.26	33.8	39.0	10.4	1,318	34.8	81.3	3.2	2,329	34.1	6.9	13.2	6.0	5.8	8.2	5	2.4	22.5	92	69	66
1803	1932-33	19-6-33	..	..	..	..	..	41	151	7.11	23.26	32.5	57.4	5.0	1,865	32.8	90.7	3.0	2,973	32.2	7.6	12.4	6.2	6.4	9.0	5	1.9	22.4	90	68	76
244	1933-34	30-4-34	40A	..	..	..	..	14	135	8.56	25.28	39.3	37.2	9.7	1,462	40.2	73.8	2.7	2,967	40.2	6.0										

18.—HAGARI 1 (Westerns).

Seasons.

1924-25 (Sample No. 65).	1931-32 (Sample No. 1311).
1925-26 (Sample No. 140).	1932-33 (Sample No. 1750).
1926-27 (Sample No. 255).	1933-34 (Sample No. 2238).
1928-29 (Sample No. 507).	1934-35 (Sample No. 2766).
1929-30 (Sample No. 736).	1935-36 (Sample No. 3154).
1930-31 (Sample No. 1031).	1936-37 (Sample No. 3643).

I. AGRICULTURAL DETAILS.

- (i) *Botanical species* :—*Gossypium herbaceum*.
- (ii) *History* :—A pure strain obtained by further selection from within the strain Westerns Hagari 25 at the Agricultural Research Station, Hagari, Bellary district. Comparative trials were started in 1925-26 and general distribution of Hagari 1 began in 1926-27.
- (iii) *District of growth* :—Parts of Bellary, Anantapur and Kurnool districts. The particular samples used in these tests have been grown at the Agricultural Research Station, Hagari.
- (iv) *Growing period* :—Sown from the last week in August to the first week in September and picked from about the middle of February to end of March; in 1934-35 due to late rains, sown only in the middle of October. In 1935-36, the crop was sown in the first week of September and picking was over by the end of March.
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—Normal rainfall 20 inches annually; 23.1" in 1932-33; 26.1" in 1933-34; 15" in 1934-35; 21.88" in 1935-36; 24.56" in 1936-37.
- (vii) *Temperature* :—Mean Minimum: 65.6°F.; Range 75° to 41.3°F.
Mean Maximum: 90.8°F.; Range 102.4° to 80.4°F.
- (viii) *Plant particulars (average values)* :—
- Bolls per plant: 4 (spacing 27" × 9").
 - Seeds per boll: 18.
 - Weight of seed: 60 milligrammes.
 - Weight of lint per seed: 24 milligrammes.
 - Ginning percentage: 29.
- (ix) *Yield of seed-cotton* :—276 lbs. per acre (1924-30); 212 lbs. per acre in 1932-33; 226 lbs. per acre in 1933-34; 164 lbs. in 1934-35; 272 lbs. per acre in 1935-36; 180 lbs. in 1936-37. Normal yield 270 lbs. per acre (Hagari Agricultural Research Station).

(x) *Area under cultivation* :—

1927-28 ..	4,300 acres.	1932-33 ..	184,700 acres.
1928-29 ..	50,700 "	1933-34 ..	200,300 "
1929-30 ..	160,300 "	1935-36 ..	200,000 " (estimated).
1930-31 ..	147,000 "	1936-37 ..	200,000 " (")
1931-32 ..	171,800 "		

In 1934-35 due to the late sowing, the number of bolls per plant was few and ginning percentage low.

II.—GRADER'S REPORT.

	1925-26.	1926-27.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Contract under	Cambodia.	C. P. No. 1.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach.	Broach	Fully Good Broach.
Class	Fine to Superfine.	Superfine.	Superfine.	Extra Superfine.	Superfine.	Extra Superfine.	Superfine.	Extra Superfine.	Extra Superfine.	Extra Superfine.	Choice Superfine.
Colour	Creamy.	White.	White.	White.	White.	White.	White.	White.	Bright white.	Bright white.	Pearly white.
Feel											Ordinary.
Staple Length	3/4-7/8 in.	13/16 in.	3/4-7/8 in.	7/8 in.	One inch.	31/32 in.	15/16 in.	7/8 in.	15/16 in.	7/8 in.	Fine 13/16 in.
Staple Strength	Poor.	Fair.	Good.	Good.	Good.	Good.	Good.	Fair.	Very good.	Good.	Moderate.
Regularity	Irregular.	Fair.	Good.	Fair.	Fair.	Good.	Fair.	Fair.	Regular.	Regular.	Regular.
Value above or below contract rate. ..		Rs. 15 on.	Rs. 45 on.	Rs. 50 on.	Rs. 60 on.	Rs. 65 on.	Rs. 25 on.	Rs. 55 on.	Rs. 80 on.	Rs. 45 on.	Rs. 40 on.
Basis		Rs. 315.	Rs. 323.	Rs. 260.	Rs. 180.	Rs. 181.	Rs. 190.	Rs. 185.	Rs. 232.	Rs. 203.	Rs. 240.
Date of Valuation		17-5-27.	8-5-29.	24-5-30.	24-5-31.	23-4-32.	1-5-33.	1-5-34.	3-7-35.	25-4-36.	4-6-37.
Remarks	Thin.								Slightly neppy.		

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.											
	1924-25.	1925-26.	1926-27.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
2	..	..	0.4	0.4	..	..	0.4	0.4	0.0	0.8	..	0.4
3	1.6	1.8	2.1	2.1	1.6	1.1	1.8	2.3	2.2	2.0	1.7	1.6
4	3.1	3.9	4.3	4.0	3.8	2.0	4.0	5.2	4.7	4.5	3.1	3.1
5	6.9	9.1	10.9	9.0	10.8	4.9	9.7	11.8	13.6	11.6	7.8	7.5
6	20.8	21.0	29.3	18.9	21.9	13.7	19.6	24.5	27.1	24.6	16.4	19.6
7	34.4	43.0	35.0	33.7	33.8	32.4	32.2	33.7	32.0	31.9	28.1	33.5
8	22.9	17.7	14.7	24.6	21.0	31.3	22.9	16.4	15.4	18.2	28.3	26.3
9	8.3	2.9	3.3	6.3	5.7	11.6	7.6	5.4	3.7	5.8	11.0	6.6
10	1.4	..	..	1.0	1.4	3.0	1.9	0.8	0.4	0.8	8.4	1.4
11	0.6	..	..	..	..	..	..	..	..	..	0.2	..
2. Fibre-Length (inch) :—												
(a) By Balls Sorter ..	0.87	0.83	0.81	0.85	0.84	0.91	0.85	0.82	0.80	0.82	0.89	0.86
(b) By Baer Sorter ..	0.86	0.82	0.82	0.84	0.84	0.91	0.88	0.83	0.80	0.84	0.91	0.86
3. Fibre-Length Irregularity (%)												
(a) .. .. .	..	..	..	..	13.8	10.1	14.8	16.3	15.9	15.5	14.4	12.2
4. Fibre-Weight per lach (millionth of an ounce).												
(a)	0.171	0.146	0.209	0.207	0.175	0.166	0.172	0.175	0.171	0.167	0.170	0.180
5. Fibre-Strength (oz.) :—												
(a) By Ball's Tester ..	..	..	..	0.140	0.128	0.161	0.162	0.149	0.130	0.124	0.149	0.144
(b) By O'Neill Tester ..	..	..	..	0.140	0.128	0.150	0.147	0.144	0.131	0.136	0.135	0.139
6. Fibre-Strength per unit fibre-weight per inch												
(a) .. .. .	..	..	..	0.68	0.73	0.94	0.90	0.84	0.76	0.78	0.83	0.79
7. Fibre-Rigidity (millionth of an ounce, square-inch)												
(a) .. .. .	..	..	..	0.164	0.129	0.123	0.133	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch)												
(a) .. .. .	..	..	..	0.65	0.71	0.66	0.65	0.70	..	..	..	..
9. Convolutions per inch												
(a) .. .. .	..	..	..	78	83	74	74	93	..	..	..	..
10. Maturity Test Results (%) :—												
(a) Mature .. .. .	..	..	..	..	..	..	..	..	..	53	65	79
(b) Half-mature .. .. .	..	..	..	..	..	..	..	..	..	28	25	15
(c) Immature .. .. .	..	..	..	..	..	..	..	..	..	19	10	6

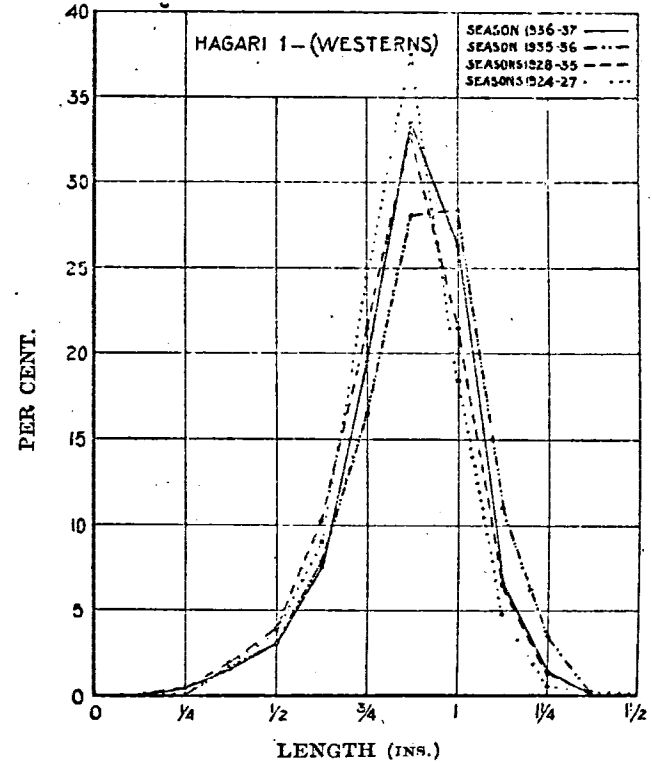


Fig. 18.—Sorter Diagrams for Hagari 1—(Westerns).

IV. SPINNING TESTS.

1. Treatment :—

(a) *Blow-room*.—Upto 1933-34 (inclusive):—Lattice feeder, Crighton (twice), Hopper, Scutcher (3 times). The 1925-26 and 1926-27 samples were passed directly through the Crighton (once); 1928-29 to 1931-32 samples were passed once through the Crighton. 1934-35 onwards:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*:—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37:—As above but spun from single hank roving on Ring Frame No. 3, which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. Spinning Master's Report :—

Season.	1924-25.	1925-26.	1926-27.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour .. ..	..	White; bright.	Whitish; bright.	White to creamy-white.	White to creamy-white; bright.	White; very bright.	White.	White; bright.	White; bright.	White; bright.	White; bright.	Creamy-white to white; bright.
Cleanliness ..	Clean.	Very clean.	Very clean; practically no leaf or stain.	Very clean.	Perfectly clean.	Perfectly clean.	Very clean.	Very clean.	Very clean.	Very clean.	Very clean.	Very clean.
Feel	Silky but much too soft.	Much too soft.	..	Full bodied.	Soft and bodied.	Full bodied.	..	Good bodied.	Smooth and bodied.	Good bodied.	Good bodied.	Good bodied.
Ginning and Neppliness.	..	..	Well-ginned.	Well-ginned.	Very well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds .. ..	..	..	..	..	Clean.	Perfectly clean.	Clean.	Clean.	Clean.	Clean.	Clean.	Good and clean.
Card-silver ..	..	..	..	..	Even and clear.	First class.	Even and nep-free.	Even and nep-free.	Even and nep-free.	Even and nep-free.	Even and nep-free.	Good and nep-free.
Weight of ten flat strips .. ..	..	..	..	..	11.25 grams.	6 grams.	11.4 grams.	12.0 grams.	13.6 grams.	16.5 grams.	10.9 grams.	10.3 grams.
Remarks .. ..	..	..	..	..	Staple fairly regular and fairly strong. A very good sample indeed.	Staple somewhat irregular in length but of good strength.	Blow room and card losses are lowest recorded in Laboratory so far	..	..	..	..	..

3. Spinning Test Details and Results :—See Table 18, page 88.

V. REMARKS.

(i) *Fibre*.—Both the mean fibre-length and the fibre-weight per unit length of this cotton occasionally show large seasonal variation. The fibre-length is exceptionally high in 1930-31 and 1935-36, higher than the average in 1924-25 and very low in 1933-34. The fibre-weight per inch is 42 per cent. higher in 1926-27 and 1928-29 than in 1925-26, but is fairly constant since 1929-30. The fibre-strength and fibre-strength per unit fibre-weight are high in 1930-31 and 1931-32. The 1936-37 sample is about 4% shorter than its immediate predecessor and possesses a significantly higher percentage of mature hairs, but in other respects it is very much like it.

(ii) *Waste*.—The samples of this cotton have been supplied in a very clean condition, as will be seen from the low blow-room loss, which, in 1930-31, was only 1.6 per cent. The card-room loss is also low in most seasons.

(iii) *Breakages*:—Yarn breakages in the ring frame are generally few in 20's counts, but they are fairly numerous in 1928-29 and 1929-30 and numerous in 1932-33. They are fairly numerous or numerous in the higher counts in most seasons. The 1935-36 sample spun well in all the three counts, but the 1936-37 sample gave fairly numerous breakages in the 30's counts.

(iv) *Yarns*.—The 20's yarns spun from this cotton have varied from 'very even' to 'even to fairly even' in the different seasons, while the 30's yarns are generally even to fairly even. They are practically free of neps in all seasons except 1929-30, when they are rather neppy. Like the fibre-properties, the yarn-strength results of this cotton are found to be subject to seasonal variation, being poor in 1928-29 and 1932-33, and very good indeed in 1930-31.

(v) *Conclusions*.—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1924-25	..	30's.	1931-32	..	30's.
1925-26	..	30's.	1932-33	..	25's.
1926-27	..	27's.	1933-34	..	28's.
1927-28	..	(Not sent for test).	1934-35	..	29's.
1928-29	..	24's.	1935-36	..	30's.
1929-30	..	27's.	1936-37	..	30's.
1930-31	..	36's.			

TABLE 18.—SPINNING TEST RESULTS FOR HAGARI 1 (WESTERNS).

HANK (1936-37).
 Card 0.18
 Slubber 0.74
 Inter 1.78
 Rover 4.50

TRAVELLER COUNTS

20s 3/0
 24s 4/0
 30s 7/0

SPINDLE SPEED (1936-37).

20A 9,500 r.p.m.
 20B 10,200 r.p.m.
 24s 10,300 r.p.m.
 30s 9,475 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.													TEMPERATURE ("F.)	RELATIVE HUMIDITY (%).					
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.			BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.			
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)					Extension Irregularity (%)	Evenness Class.	Neps per yard.	Turns per inch Actual.
507	1924-27	2-5-29	20A	9.9	9.7	0.5	13.5	11	185	4.39	16.85	19.3	84.5	5.0	1,631	20.0	110.4	3.7	2,208	19.3	11.8	9.7	1.8	6.1	9.4	1.8	2.2	16.3	88	75	71
736	1924-29	2-5-29	..	9.9	9.9	0.4	10.1	35	191	4.44	16.85	19.6	86.7	4.9	1,307	19.7	130.2	3.2	2,565	20.1	10.1	13.2	6.0	7.0	7.8	0.9	0.9	16.3	92	69	69
1031	1930-31	21-4-31	..	1.6	5.0	0.4	7.0	48	200	4.30	16.85	19.4	81.0	7.1	1,671	19.7	130.2	3.2	2,565	20.1	11.9	9.9	0.7	8.0	7.8	2.9	0.7	16.2	91	62	66
1311	1931-32	26-4-32	..	9.9	5.9	0.9	8.6	26	198	4.32	16.85	19.8	80.0	5.7	1,584	19.6	132.9	3.9	2,605	20.1	11.2	9.6	2.0	7.0	8.4	3	0.6	16.2	87	60	68
1750	1932-33	3-5-33	..	9.9	9.6	0.6	10.8	73	199	4.26	16.85	19.9	89.0	6.9	1,973	20.1	117.0	3.0	2,552	19.8	10.2	14.4	6.8	6.6	10.4	0.9	0.6	16.2	89	67	69
2238	1933-34	21-4-34	..	9.8	7.8	0.4	10.8	26	200	4.50	16.85	19.6	76.6	5.0	1,501	19.4	129.6	3.6	2,514	19.4	11.4	12.0	3.5	6.0	9.2	3	0.6	16.0	87	68	69
2766	1934-35	5-7-35	..	9.9	8.2	0.4	11.9	99	194	4.52	16.85	20.0	78.6	5.9	1,572	19.9	130.5	3.5	2,597	20.0	11.0	12.1	4.5	7.2	8.4	3	0.8	15.8	84	74	73
3154	1935-36	24-4-36	..	9.9	5.4	0.9	8.8	16	185	4.40	16.85	19.5	81.0	5.4	1,604	19.9	122.5	3.2	2,533	20.2	11.4	10.8	3.8	5.8	11.6	3	0.5	16.2	88	66	70
3643 1	1936-37	3-6-37	..	9.9	6.3	0.4	10.2	28	205	4.27	16.85	20.1	79.0	7.2	1,588	19.8	130.2	3.0	2,578	20.2	10.9	10.6	3.0	5.6	12.2	3	0	15.9	90	68	64
3643 2	1936-37	5-6-37	..	9.9	6.0	0.4	10.0	0	206	4.44	16.85	19.6	80.0	6.5	1,568	19.4	127.4	3.2	2,472	20.0	10.0	12.8	4.5	6.2	8.9	3	0	16.0	90	66	75
507	1924-27	2-5-29	20B	..	..	..	..	7	192	4.49	17.98	19.5	86.6	4.6	1,689	19.6	120.3	3.6	2,370	19.8	11.2	8.0	0.7	7.2	6.4	2	1.1	17.4	86	77	83
736	1924-29	2-5-29	..	..	..	..	..	17	190	4.47	17.98	19.4	79.8	5.6	1,548	19.7	120.3	3.6	2,370	19.8	11.2	8.0	0.7	7.2	6.4	2	1.1	17.0	93	72	70
1031	1930-31	21-4-31	..	..	..	..	..	22	195	4.35	17.98	19.5	86.5	4.4	1,687	19.8	134.5	3.6	2,603	20.0	12.8	9.6	1.0	8.8	6.7	4	3.2	17.8	92	61	67
1311	1931-32	26-4-32	..	..	..	..	..	27	197	4.55	17.98	20.0	97.6	5.4	1,952	20.3	147.2	3.8	2,988	20.5	13.3	9.2	1.8	7.2	7.7	8	1.0	17.2	90	67	69
1750	1932-33	3-5-33	..	..	..	..	..	13	194	4.32	17.98	20.1	86.6	4.8	1,741	19.8	139.4	3.2	2,760	20.2	12.0	9.4	1.8	6.9	7.4	2	1.0	17.3	87	68	68
2238	1933-34	21-4-34	..	..	..	..	..	50	193	4.30	17.98	19.7	81.4	6.2	1,604	19.7	128.6	4.2	2,533	19.6	11.4	10.7	2.8	6.8	7.8	3	0.8	17.3	90	68	70
2766	1934-35	4-7-35	..	..	..	..	..	10	200	4.46	17.98	19.8	83.0	5.7	1,643	19.7	138.7	4.4	2,732	20.0	12.0	10.0	1.0	6.0	9.2	3	0.9	17.2	88	68	70
3154	1935-36	24-4-36	..	..	..	..	..	21	200	4.52	17.98	19.9	86.0	4.0	1,711	19.8	138.8	3.4	2,748	20.4	11.4	9.4	1.5	7.4	8.6	3	0.8	16.8	85	74	71
3643 1	1936-37	3-6-37	..	..	..	..	..	16	194	4.50	17.98	20.2	87.9	4.7	1,776	20.0	127.1	3.0	2,542	20.4	12.0	10.8	3.8	6.0	10.0	3	0.4	17.3	87	68	73
3643 2	1936-37	5-6-37	..	..	..	..	..	21	207	4.43	17.98	19.6	90.4	5.8	1,772	19.9	132.0	3.3	2,627	19.7	12.6	8.9	1.0	6.1	10.1	3	0.5	17.0	89	70	67
2766	1934-35	4-7-35	24	..	..	..	..	36	208	4.44	17.98	19.8	88.3	4.3	1,748	19.7	133.6	4.1	2,632	20.7	11.1	9.4	2.0	6.2	9.5	3	0	17.1	90	66	75
3154	1935-36	24-4-36	..	..	..	..	..	46	182	5.43	19.73	24.0	66.0	4.6	1,584	24.4	105.7	2.7	2,570	24.6	9.0	10.6	1.8	6.6	9.3	4	1.1	18.5	85	77	71
3643 1	1936-37	3-6-37	..	..	..	..	..	9	174	5.42	19.73	23.6	70.4	4.6	1,661	23.6	107.5	2.4	2,537	23.5	10.2	10.7	2.2	6.1	9.0	3	0.6	19.2	87	67	72
3643 2	1936-37	4-6-37	..	..	..	..	..	14	190	5.47	19.73	23.9	67.9	4.7	1,623	23.5	107.0	2.3	2,514	25.2	8.5	11.6	0.5	5.7	7.5	4	0.2	18.8	90	68	67
2766	1934-35	4-7-35	..	..	..	..	..	12	190	5.83	19.73	23.5	70.9	5.9	1,666	23.6	108.4	2.8	2,558	24.9	8.7	12.2	4.0	5.8	8.7	4	1.2	18.8	89	69	76
1031	1930-31	21-4-31	30	..	..	..	..	5	146	6.65	21.86	29.1	48.6	6.8	1,414	30.8	89.5	2.2	2,757	31.0	7.4	10.9	2.8	5.1	10.6	4	2.1	21.3	88	76	69
1311	1931-32	25-4-32	..	..	..	..	..	11	161	6.81	21.86	30.0	55.2	6.1	1,656	30.8	89.5	2.2	2,757	31.0	7.6	11.4	3.2	5.8	10.8	4	1.4	21.0	91	68	64
1750	1932-33	4-5-33	..	..	..	..	..	42	158	6.29	21.86	29.6	48.3	5.9	1,430	29.2	87.0	2.6	2,540	29.8	7.6	11.8	4.2	6.0	8.0	4	1.1	21.0	88	65	68
2238	1933-34	29-4-34	..	..	..	..	..	90	160	6.40	21.86	29.8	41.7	5.5	1,243	29.4	80.5	2.4	2,367	31.2	5.7	14.6	6.2	5.2	11.0	4	1.1	21.2	90	65	70
2766	1934-35	4-7-35	..	..	..	..	..	42	180	6.62	21.86	29.6	46.7	6.0	1,382	29.2	85.4	3.3	2,494	30.2	7.4	13.3	5.0	4.8	14.2	4/5	0.9	20.9	88	69	70
3154	1935-36	27-4-36	..	..	..	..	..	38	158	6.76	21.86	30.4	47.0	7.0	1,429	30.3	86.4	3.0	2,618	30.6	7.1	13.4	6.5	6.0	12.5	4	1.2	20.9	86	80	69
3643 1	1936-37	4-6-37	..	..	..	..	..	10	158	6.72	21.86	30.3	48.4	6.4	1,467	30.4	83.6	2.4	2,541	30.8	6.7	13.9	7.0	5.3	9.0	4	0.9	21.2	87	65	71
3643 2	1936-37	4-6-37	..	..	..	..	..	30	158	6.74	21.86	30.1	48.6	6.5	1,463	30.0	85.4	2.6	2,562	31.1	6.7	12.8	6.5	5.6	8.3	4	0.8	20.7	90	68	64
1031	1930-31	21-4-31	40	..	..	..	..	3	114	8.82	26.97	39.2	32.3	6.8	1,266	39.4	68.6	2.6	2,813	41.0	5.6	10.8	3.8	3.8	15.2	6	4.7	25.6	88	76	63
1311	1931-32	25-4-32	..	..	..	..	..	23	131	9.14	26.97	39.8	35.4	5.4	1,409	41.0	68.6	2.6	2,813	41.0	5.3	13.0	9.0	5.2	16.5	6	1.1	25.6	91	60	64
1750	1932-33	4-5-33	..	..	..	..	..	49	130	8.56	26.97	40.4	30.7	6.8	1,240	40.3	61.8	2.9	2,491	40.7	4.8	15.8	8.5	5.2	13.8	5	1.4	26.0	87	67	67
2238	1933-34	29-4-34	..	..	..	..	..	84	129	8.86	26.97	39.0	29.0	7.8	1,131	39.0	59.6	3.3	2,324	39.6	4.4	17.5	10.5	4.6	18.7	6	1.2	26.0	89	64	64
2766	1934-35	29-4-34	..	..	..	..	..	38	122	8.7																					

III.—FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-length in eighths of an inch.	Percentage.													
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.	
2	0.2	1.3	0.5	0.3	0.5	0.4	0.2	0.3	0.1	1.0	1.3	0.6	0.6	
3	1.5	2.0	1.8	2.1	2.4	2.1	2.9	2.9	2.4	2.8	2.6	2.2	2.4	
4	2.5	5.1	4.1	4.1	5.0	4.7	5.5	5.9	4.2	5.8	5.4	4.8	5.0	
5	8.3	10.3	9.6	9.3	13.0	10.5	11.0	13.3	10.0	12.4	10.7	10.9	10.4	
6	21.4	22.0	19.1	19.2	26.5	20.3	23.8	24.5	19.8	22.8	23.0	21.1	22.1	
7	42.0	31.5	34.6	32.1	27.2	33.3	32.6	23.6	30.5	29.1	29.1	31.6	29.6	
8	17.8	19.6	21.7	25.1	17.3	20.6	17.2	17.7	22.7	18.9	19.4	20.6	20.8	
9	4.9	6.7	6.8	7.7	6.2	7.7	5.9	5.2	8.6	6.0	6.9	7.0	7.5	
10	1.2	0.9	1.8	0.1	1.3	0.4	0.9	1.6	1.7	1.2	1.6	1.2	1.6	
11	0.2	..	..	..	..	..	..	..	..	..	..	..	..
2. Fibre-Length (inch) :—														
(a) By Balls Sorter ..	0.85	0.83	0.85	0.85	0.81	0.84	0.82	0.82	0.80	0.82	0.83	0.84	0.84	
(b) By Baer Sorter ..	0.84	0.83	0.85	0.85	0.82	0.83	0.82	0.82	0.80	0.82	0.83	0.82	0.83	
3. Fibre-Length Irregularity (%)														
..	..	..	..	..	..	16.4	16.6	17.1	15.5	18.6	17.4	16.6	16.3
4. Fibre-Weight per inch (milli-ounce)														
..	0.164	0.173	0.192	0.183	0.186	0.181	0.161	0.181	0.167	0.164	0.167	0.157	0.170	
5. Fibre-Strength (oz.) :—														
(a) By Balls Tester ..	..	..	0.191	0.187	0.163	0.176	0.166	0.194	0.200	0.197	0.200	0.166	0.188
(b) By O'Neill Tester ..	..	..	0.170	0.167	0.156	0.166	0.148	0.185	0.205	0.199	0.188	0.162	0.200
6. Fibre-Strength per unit fibre-weight per inch														
..	..	..	0.95	0.97	0.85	0.94	0.93	1.05	1.21	1.21	1.16	1.04	1.14
7. Fibre-Rigidity (milli-ounce of an ounce, square inch)														
..	..	..	0.170	0.150	0.184	0.215	0.119	0.196	..	..	..	..	..
8. Ribbon-Width (thousandth of an inch)														
..	0.70	0.64	0.65	0.62	0.70	0.73	0.66	0.67	0.69	..	..	..	..
9. Convolution per inch														
..	121	114	57	62	74	50	71	70	70	..	..	..	..
10. Maturity Test Results (%)														
(a) Mature	52	55	65
(b) Half-mature	16	19	16
(c) Immature	32	26	19

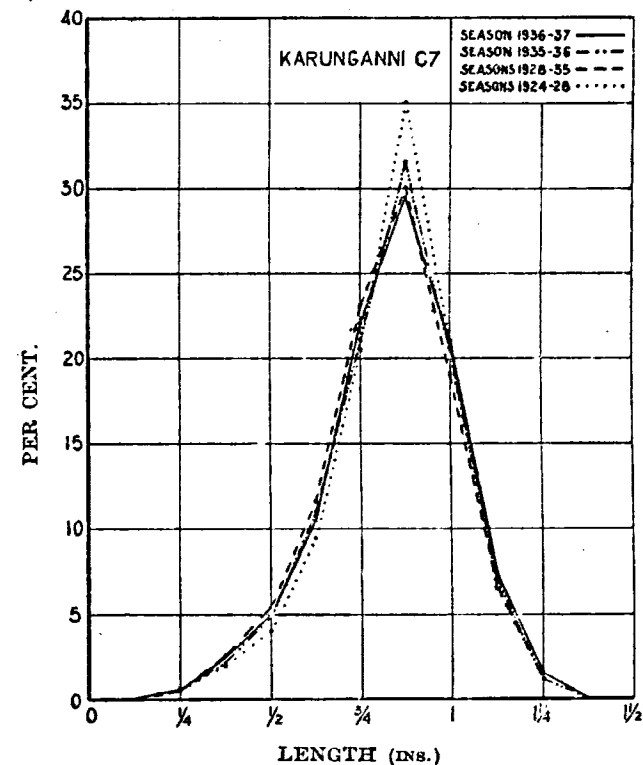


Fig. 19.—Sorter Diagrams for Karunganni C7.

IV. SPINNING TESTS.

1. *Treatment* :—

(a) *Blow-room*.—Upto 1933-34 (inclusive):—Lattice Feeder, Crighton (once only), Hopper, Scutcher (3 times). The 1926-27 cotton was passed direct through the Crighton (once only). The 1932-33 and 1933-34 cottons were passed twice through the Crighton.

1934-35 onwards:—Hopper bale opener, Horizontal cleaner, Crighton (once), Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).

(b) *Card-room*.—Upto 1934-35 (inclusive):—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 1.

1935-36 and 1936-37 :—As above but spun from single hank roving on Ring Frame No. 3 which is fitted with tape drive arrangement for spindles, while Ring Frame No. 1 possesses a band drive arrangement.

2. *Spinning Master's Report* :—

Season.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.
Colour	Creamy-white.	Creamy-white; fairly bright.	Creamy-white; bright.	Creamy-white; bright.	Creamy-white; bright.	Creamy-white; very bright.	White to creamy-white; bright.	White bright.	White to creamy-white; bright.	White to creamy-white; bright.	White to creamy-white.
Cleanliness ..	Clean; a little leafy.	Clean.	Very clean.	Perfectly clean.	Very clean.	Very clean.	..	Clean.	Clean.	Clean.	Fairly clean.
Feel .. ..	..	Nice.	Good soft.	Good bodied.	Slightly soft but good bodied.	Soft and bodied.	Soft and bodied.	Smooth and bodied.	Good smooth.	Good smooth.	Good smooth.
Ginning and Neppiness	Well-ginned.	Nepped in ginning.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.	Well-ginned.
Seeds .. ..	..	Too many (0.8 per cent.) un-ginned seeds.	A few full clean seeds.	..	..	..	..	..	..	..	A few undeveloped seeds.
Card sliver ..	..	..	..	..	Clean.	Clean.	Clean.	Clean.	Clean.	Clean.	Good and clean.
Card web .. ..	..	..	..	..	Slightly neppy.	Good.	Even and nep-free.	Good.	Good.	Good.	Good and nep-free.
Weight of ten flat strips .. ..	..	..	..	..	13.7 grams.	13.0 grams.	16.0 grams.	15.6 grams.	20.4 grams.	11.6 grams.	13.5 grams.
Remarks .. ..	..	..	..	Staple regular in length and strong.	..	..	..	..	..	..	..

3. *Spinning Test Details and Results* :—See Table 19, page 92.

V.—REMARKS.

(i) *Fibre*.—Except for occasional and small variations the mean fibre-length of this cotton has shown remarkable consistency. The fibre-length irregularity, however, is a little on the high side. The fibre-weight per inch is rather variable, though since 1932-33 it has remained fairly constant. The fibre-strength and the fibre-strength per unit fibre-weight per inch show a good improvement since 1931-32, the 1935-36 sample being an exception. Both the fibre-rigidity and the ribbon width are unusually high in 1929-30 and the former very low in 1930-31. The number of convolutions per inch is highly variable, the 1929-30 value being less than half of that in 1924-25. The 1936-37 sample has practically the same mean fibre-length as its predecessor; it is, however, somewhat coarser but stronger and has a larger percentage of mature hairs.

(ii) *Waste*.—This is a clean cotton and has usually yielded a small blow-room loss. The 1934-35 and 1936-37 samples, however, are not so clean as the other samples. The card-room loss is generally about 8 per cent., though it is rather high for the 1934-35 sample.

(iii) *Breakages*.—With a few exceptions, yarn-breakages in the ring frame are rather numerous for this cotton, even in 20's counts. They are very numerous for the 1929-30 sample.

(iv) *Yarns*.—This cotton usually gives even 20's and even to fairly even 26's, the 1932-33 yarns being rather better than usual in this respect. Its yarns are inclined to be somewhat neppy, those of 1934-35 being distinctly neppy, but the 1935-36 yarns show a good improvement in this respect which has been maintained in the current season. The yarn-strength results are poor in 1928-29, not much better in 1931-32 and best of all in 1936-37.

(v) *Conclusion*.—The following are the highest standard warp counts for which this cotton is adjudged suitable in the different seasons :—

1924-25 ..	26's.	1928-29 ..	20's.	1931-32 ..	21's.	1934-35 ..	28's.
1925-26 ..	26's.	1929-30 ..	23's.	1932-33 ..	23's.	1935-36 ..	23's.
1926-27 ..	24's.	1930-31 ..	26's.	1933-34 ..	25's.	1936-37 ..	34's.
1927-28 ..	24's.						

TABLE 19.—SPINNING TEST RESULTS FOR KARUNGANNI C7.
TRAVELLER COUNTS.

HANK (1936-37).
Card 0.16
Slubber.. .. . 0.78
Inter 1.77
Rover 4.62

20 3/0
26 5/0
30 7/0

SPINDLE SPEED (1936-37).
20A 9,500 r.p.m.
20B 10,200 r.p.m.
26 9,500 r.p.m.
30 9,500 r.p.m.

Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%).							
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.			BALLISTIC.			SINGLE THREAD.							Spinning Room.	Spinning Room.	Testing Room.					
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%).	Count-Strength Product.	Counts Actual.	Work of Rupture (inch—lbs.)	Work Irregularity (%).	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%).	Weakness Percentage.					Extension (%).	Extension Irregularity (%).	Evenness Class.	Neps per yard.	Turns per inch Actual.
510	1924-28	7-5-29	20A	4.5	8.8	0.6	12.8	21	189	4.32	16.85	19.9	72.2	7.6	1,437	..	..	..	20.1	10.2	13.3	5.6	5.7	8.6	3	2.8	16.2	88	70	65	
717	1924-29	7-5-29	..	4.4	8.8	0.6	12.8	57	183	4.37	16.85	19.4	58.7	5.7	1,100	19.6	107.6	4.3	2,109	19.6	9.7	11.8	5.5	6.6	10.0	4	4.2	16.2	91	65	70	
1045	1929-30	24-4-30	..	3.3	8.5	0.6	12.6	95	186	4.60	16.85	19.3	67.2	8.1	1,297	19.8	118.3	3.9	2,352	20.5	9.6	16.4	5.6	6.6	11.4	3	3.7	16.1	92	61	63	
1320	1930-31	7-5-31	..	4.9	8.8	0.4	13.6	37	190	4.60	16.85	19.7	71.5	6.0	1,400	19.8	121.5	12.8	2,406	19.6	11.2	12.8	6.0	7.0	8.0	3	3.6	16.4	91	70	70	
1320	1931-32	11-5-32	..	3.8	7.3	0.4	11.2	39	186	4.50	16.85	19.6	61.0	8.8	1,190	19.6	128.9	3.0	2,528	20.1	9.4	14.8	7.5	6.2	7.0	3	1.6	16.3	89	68	66	
1777	1932-33	26-5-33	..	5.6	9.2	0.4	14.7	57	190	4.51	16.85	19.2	70.8	8.2	1,359	19.0	133.1	3.7	2,529	19.4	11.0	13.9	4.5	7.2	7.4	3	2.3	16.2	89	65	71	
2276	1933-34	17-5-34	..	4.1	8.5	0.6	12.7	47	183	4.40	16.85	19.2	79.7	6.3	1,530	19.6	129.4	4.2	2,536	19.0	13.4	12.9	3.8	6.8	7.5	3	2.2	16.2	89	70	76	
2765	1934-35	3-7-35	..	6.6	10.4	0.4	16.6	24	192	4.40	16.85	19.6	82.0	5.1	1,607	19.3	150.6	3.6	2,907	19.6	12.2	13.3	6.0	7.3	9.1	3	6.8	16.2	86	76	78	
3156	1935-36	13-5-36	..	5.0	6.8	0.4	11.8	16	186	4.50	16.85	20.4	59.0	7.2	1,204	20.4	118.2	3.6	2,411	21.2	9.3	13.2	6.0	5.4	10.4	3	1.2	16.6	90	67	70	
3651/1	1936-37	13-6-37	..	8.8	7.7	0.3	16.1	0	202	4.48	16.85	19.6	91.5	5.2	1,793	19.6	139.2	3.8	2,724	20.3	11.8	11.4	3.0	6.4	8.6	3	1.0	16.4	88	72	80	
3651/2	1936-37	16-6-37	..	8.2	7.7	0.5	15.7	16	208	4.47	16.85	20.0	89.6	4.3	1,792	19.7	139.6	3.0	2,750	20.6	12.2	10.1	2.0	7.3	9.5	3	1.8	16.2	90	71	80	
270	1926-27	13-7-27	20B	..	..	..	..	12	191	4.35	17.98	20.0	81.2	5.9	1,624	..	..	..	20.9	10.5	11.6	4.5	6.3	6.6	3	4.1	17.4	85	78	71	
510	1924-29	7-5-29	..	..	..	..	..	36	187	4.44	17.98	19.4	68.9	6.2	1,337	19.7	118.8	4.5	2,340	20.0	10.7	13.5	7.0	6.7	10.4	4	4.4	17.3	90	65	73
717	1929-30	24-4-30	..	..	..	..	..	37	190	4.65	17.98	19.6	77.2	6.9	1,513	19.6	126.9	3.5	2,487	20.0	11.1	10.1	2.7	5.8	9.9	3	3.8	17.2	90	64	62
1045	1930-31	7-5-31	..	..	..	..	..	72	190	4.60	17.98	19.8	82.6	6.2	1,635	20.0	127.1	2.6	2,542	20.0	11.9	11.0	3.8	7.2	9.0	3	4.4	17.1	90	73	70
1320	1931-32	11-5-32	..	..	..	..	..	86	190	4.56	17.98	19.8	71.4	7.0	1,414	19.6	131.2	3.3	2,572	20.2	10.5	12.8	7.0	6.5	8.8	4	1.4	17.4	89	68	66
1777	1932-33	26-5-33	..	..	..	..	..	46	190	4.55	17.98	19.8	75.2	5.8	1,548	19.8	120.9	3.5	2,513	20.3	11.0	12.6	5.0	7.0	7.4	2	1.9	17.4	90	66	70
2276	1933-34	17-5-34	..	..	..	..	..	62	195	4.40	17.98	19.6	85.1	6.7	1,664	19.8	135.8	3.3	2,689	20.8	13.2	9.2	1.2	6.2	8.0	3	2.4	17.2	89	70	74
2765	1934-35	3-7-35	..	..	..	..	..	39	194	4.49	17.98	19.7	92.2	6.0	1,816	19.4	152.7	4.4	2,962	19.6	13.4	11.4	1.8	7.6	9.1	3	6.9	17.2	87	74	76
3156	1935-36	14-5-36	..	..	..	..	..	8	192	4.46	17.98	20.2	73.4	6.6	1,489	20.4	125.5	3.4	2,560	20.2	11.4	11.2	3.8	5.8	9.0	3	1.6	17.4	90	67	70
3651/1	1936-37	13-6-37	..	..	..	..	..	10	208	4.43	17.98	19.6	100.8	6.2	1,976	19.8	143.2	4.1	2,835	19.9	13.8	12.4	6.0	6.9	7.2	3	1.5	17.2	89	67	81
3651/2	1936-37	16-6-37	..	..	..	..	..	0	208	4.47	17.98	20.0	98.7	5.9	1,974	19.4	161.6	3.8	3,135	20.5	13.4	11.2	3.0	7.3	11.6	3	1.2	17.4	90	69	82
343	1927-24	11-5-24	26	..	..	..	..	22	171	5.94	20.23	25.6	52.4	8.3	1,341	..	..	..	26.1	8.2	13.4	7.5	5.3	11.6	4	3.4	19.7	91	64	67	
510	1924-29	7-5-29	..	..	..	..	..	23	152	5.79	20.23	25.4	40.0	8.6	1,016	25.3	81.9	4.0	2,072	25.7	7.4	17.0	10.0	6.0	8.8	6	3.6	19.4	91	64	72
717	1929-30	24-4-30	..	..	..	..	..	76	168	6.10	20.23	25.0	48.7	8.3	1,217	25.6	94.4	3.0	2,417	26.6	7.2	15.0	10.5	4.9	12.7	5	4.1	19.4	91	61	62
1045	1930-31	9-5-31	..	..	..	..	..	34	159	5.90	20.23	25.6	55.2	7.7	1,413	25.4	97.6	2.2	2,479	25.4	8.6	12.1	4.2	6.8	9.5	4	5.8	19.4	91	67	70
1320	1931-32	13-5-32	..	..	..	..	..	67	158	5.80	20.23	25.4	44.2	10.8	1,123	25.0	95.3	3.0	2,440	26.4	7.2	15.0	8.2	5.8	10.2	4	1.6	19.4	91	66	66
1777	1932-33	26-5-33	..	..	..	..	..	61	160	5.77	20.23	25.6	50.7	7.9	1,293	25.9	93.6	2.6	2,424	26.7	8.0	12.7	5.8	6.6	10.1	4	2.6	19.6	90	65	70
2276	1933-34	17-5-34	..	..	..	..	..	46	164	5.78	20.23	25.6	54.6	8.0	1,398	25.5	98.2	3.3	2,504	26.6	9.5	12.8	5.5	5.4	9.6	4	2.6	19.4	90	66	75
2765	1934-35	3-7-35	..	..	..	..	..	18	162	5.92	20.23	25.8	60.0	6.6	1,548	25.6	104.8	2.4	2,683	26.3	8.7	14.6	8.5	6.8	9.6	4	7.0	19.4	87	74	76
3156	1935-36	14-5-36	..	..	..	..	..	22	169	5.76	20.23	26.4	46.2	9.8	1,220	26.6	92.3	2.7	2,455	26.9	7.5	14.8	10.2	4.8	13.7	4	1.4	19.6	89	68	71
3651/1	1936-37	13-6-37	..	..	..	..	..	4	172	5.71	20.23	25.8	63.5	4.0	1,767	25.2	106.2	2.3	2,678	25.9	9.7	12.5	3.0	6.0	7.7	5	1.5	19.5	90	67	83
3651/2	1936-37	17-6-37	..	..	..	..	..	12	172	5.68	20.23	26.1	66.2	5.4	1,728	25.5	110.4	2.7	2,815	25.6	10.0	12.8	5.5	6.8	7.8	5	2.0	19.3	89	72	80
1045	1924-28	7-5-31	30A	..	..	..	..	21	148	6.46	21.86	29.9	43.6	9.5	1,304	..	..	..	30.8	6.7	13.2	6.6	5.0	11.0	4	2.7	21.2	87	70	64	
1320	1931-32	13-5-32	..	..	..	..	..	48	148	6.98	21.86	30.4	38.2	9.2	1,161	30.8	79.9	3.4	2,461	30.4	6.6	15.7	9.5	6.2	12.0	6	4.4	21.9	91	68	70
1777	1932-33	26-5-33	..	..	..	..	..	70	142	6.90	21.86	30.4	29.4	13.6	894	30.6	82.7	3.7	2,531	31.2	5.6	18.0	11.0	5.4	10.4	5	1.8	21.0	91	66	66
2276	1933-34	17-5-34	..	..	..	..	..	91	150	6.54	21.86	29.0	42.7	9.2	1,238	29.4	84.2	3.0	2,450	28.8	7.2	14.4	8.2	6.5	11.4	5	2.0	21.2	89	66	72
2765	1934-35	3-7-35	..	..	..	..	..	81	154	6.71	21.86	29.3	42.9	10.2	1,257	29.1	84.3	3.													

20.—KOILPATTI I.

Season 1936-37 (Sample No. 3666).

I. AGRICULTURAL DETAILS.

- (i) *Botanical Species* :—*Gossypium Indicum*.
- (ii) *History* :—A pure strain obtained by further selection from C7, made in 1928-29. It was grown under comparative trials during 1931-32, 1932-33 and 1933-34 at the Koilpatti Agricultural Research Station and given for general distribution during 1934-35. It is more vigorous and produces an earlier crop. In addition, it is resistant to bud and boll shedding by untimely rains while C7 is very susceptible to shedding.
- (iii) *District of growth* :—Madura, Ramnad and Tinnevely districts. The particular sample used in these tests has been grown on the Government Farm, Koilpatti.
- (iv) *Growing period* :—Sown in October and picked in March and April and also during June and July (when a second flush is obtained).
- (v) *Soil* :—Black cotton soil.
- (vi) *Rainfall* :—30" annually and 19" during the growing period, October to February. The rainfall in 1936-37 was 25.39" of which 14.21" was during the growing period and which was below the average by 4.85" and the cotton crop suffered in the later stages from want of moisture in the lower layers of the soil.
- (vii) *Temperature* :—October to April : Max. 77°—99°F.
Min. 59°—82°F.
- (viii) *Plant particulars (average values)* :—
- Bolls per plant : 14 (spacing 18" × 12").
 - Seeds per boll : 19.
 - Weight of seed : 56 milligrammes.
 - Weight of lint per seed : 24.2 milligrammes.
 - Ginning percentage : 29.
- (ix) *Yield of seed-cotton* :—635 lbs. per acre (average of 5 years 1931-36).
- | | |
|-----------|--------------------|
| 1933-34 : | 652 lbs. per acre. |
| 1934-35 : | 766 „ |
| 1935-36 : | 366 „ |
- (x) *Area under cultivation* :—1936-37 : 14,010 acres.

II. GRADER'S REPORT.

Season.	1936-37.
Contract valued under	Broach J/A.
Class	Extra superfine.
Colour	Bright white.
Feel	Very silky.
Staple Length	15/16".
Staple Strength	Very good.
Regularity	Regular.
Value above or below Contract rate	Rs. 85 on.
Basis	Rs. 227.
Date of Valuation	19-6-37.
Remarks .. .. .	..

III. FIBRE PARTICULARS.

1. Fibre-Length Distribution (Balls Sorter) :—

Mean group-Length in eighths of an inch.	Percentage.
	1936-37
2	0.9
3	2.4
4	5.2
5	9.8
6	20.8
7	28.4
8	22.9
9	7.1
10	2.2
11	0.3
2. Fibre-Length (inch) :—	
(a) By Balls Sorter	0.84
(b) By Baer Sorter	0.86
3. Fibre-Length Irregularity (%)	17.0
4. Fibre-Weight per inch (millionth of an ounce).. .. .	0.146
5. Fibre-Strength (oz.) :—	
(a) By Balls Tester	0.171
(b) By O'Neill Tester	0.171
6. Fibre-strength per unit fibre weight-per inch.	1.17
7. Maturity Test Results (%) :—	
(a) Mature	69
(b) Half-mature	14
(c) Immature	17

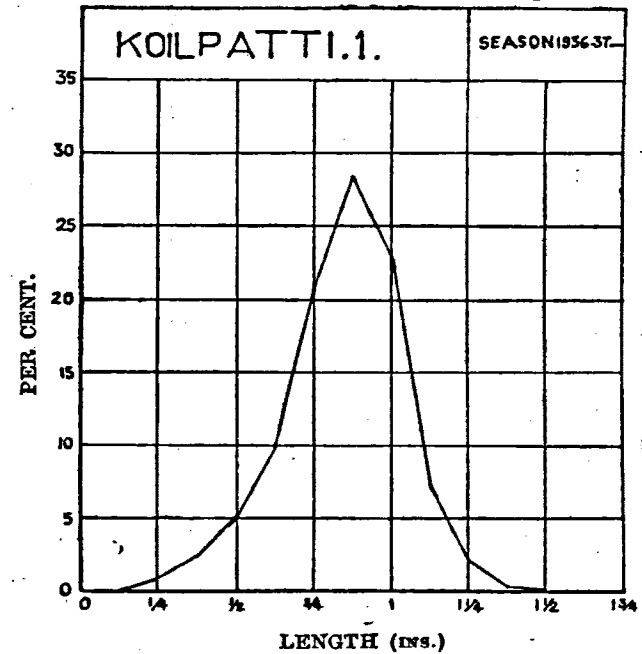


Fig. 20.—Sorter diagram for Koilpatti I.

IV.—SPINNING TESTS.

1. *Treatment* :—

- (a) *Blow-room*—1936-37 :—Hopper bale opener, Horizontal cleaner, Crighton, Gridded dust trunks, Cage exhaust, Hopper feeder, Scutcher (3 times).
- (b) *Card-room*—1936-37 :—Card, Drawing (2 heads), Slubber, Inter, Rover and spun from single hank roving on Ring Frame No. 3.

2. *Spinning Master's Report* :—

Season.	1936-37.
Colour	White to creamy-white.
Cleanliness	Clean.
Feel	Good soft.
Ginning and neppiness	Well-ginned.
Seeds .. .. .	..
Card sliver	Good and soft.
Card web	Good.
Weight of 10 flat ships	16.6 grams.
Remarks. ....	..

V.—REMARKS.

(i) *Fibre*.—Although this cotton is just about 15/16" in staple, it is somewhat fine for its length. This feature coupled with the satisfactory fibre-strength gives it an unusually high intrinsic strength. Moreover, this cotton possesses a fairly high percentage of mature fibres.

(ii) *Waste*.—This year's sample gave about 7 per cent. loss in the blow-room and about 9 per cent. in the card-room.

(iii) *Breakages*.—This cotton spun satisfactorily in the ring frame up to 34's counts.

(iv) *Yarns*.—This year's sample gave even 20's and even to fairly even 30's yarns. Its yarns, however, are somewhat neppy. From its yarn-strength results this cotton is adjudged suitable for spinning up to 36's standard warp counts.

TABLE 20.—SPINNING TEST RESULTS FOR KOILPATTI I.

				HANK (1936-37)				TRAVELLER COUNTS				SPINDLE SPEED (1936-37)																			
Card	..	..	..	0.16				20s	..	..	..	3/0				20A	..	..	..	9,450 r.p.m.											
Slubber	..	..	..	0.74				30s	..	..	..	7/0				20B	..	..	..	10,200 r.p.m.											
Inter	..	..	..	1.72				34s	..	..	..	9/0				30	..	..	..	9,450 r.p.m.											
Rover	..	..	..	3.51; 4.56												34	..	..	..	9,900 r.p.m.											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Sample No.	Season.	Date of Spinning.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.														TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)				
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.								Spinning Room.	Spinning Room.	Testing Room.		
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch.—lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)					Evenness Class.	Neps per yard.	Turns per inch Actual.
3666/1	1936-37	18-6-37	20A	7.1	8.7	0.3	15.4	0	208	5.95	16.85	20.1	91.5	5.2	1,830	20.2	144.4	4.2	2,917	20.2	11.7	11.5	4.0	6.8	10.7	3	1.8	16.3	89	75	81
3666/2	1936-37	19-6-37	..	7.2	9.3	0.4	16.1	0	208	5.83	16.85	19.5	94.8	4.7	1,849	19.0	150.0	3.7	2,940	19.5	13.2	9.5	1.5	7.2	5.9	3	3.0	10.8	87	72	80
3666/1	1936-37	19-6-37	20B	..	..	..	..	5	207	5.95	17.98	10.7	104.8	4.4	2,065	19.4	155.8	6.0	3,023	20.1	12.9	12.1	4.5	7.1	10.5	3	2.2	17.4	89	73	78
3666/2	1936-37	19-6-37	..	..	..	..	..	21	206	5.83	17.98	19.6	104.7	4.2	2,052	19.8	152.6	2.3	3,021	19.9	13.0	10.4	3.0	7.3	8.7	3	2.8	17.4	89	73	82
3666/1	1936-37	21-6-37	30	..	..	..	..	10	158	6.32	21.86	29.6	62.9	6.8	1,862	29.1	98.6	2.5	2,869	30.3	8.3	14.6	6.5	6.0	12.7	4	2.8	21.0	85	80	81
3666/2	1936-37	22-6-37	..	..	..	..	..	20	157	6.32	21.86	28.9	65.0	5.0	1,878	29.3	99.6	2.5	2,918	29.1	9.3	11.0	2.5	6.7	8.8	4	3.0	21.2	85	81	83
3666/1	1936-37	3-8-37	34	..	..	..	..	15	157	7.43	23.29	33.5	49.5	8.5	1,658	33.9	86.0	3.0	2,915	33.7	0.8	11.9	9.0	5.8	12.7	5	2.3	22.6	85	77	78
3666/2	1936-37	4-8-37	..	..	..	..	..	6	157	7.65	23.26	34.0	48.9	5.4	1,663	33.9	84.0	2.7	2,848	34.5	6.6	13.2	7.0	5.9	7.0	5	2.6	22.7	86	74	77

* Diameter of ring frame front roller— $\frac{3}{8}$ inch. Diameter of rings— $1\frac{1}{8}$ inch.

TABLE 21.—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-37.

A.—ENGLISH UNITS.

Report No.	Cotton.	Season.	Fibre-Length (inch.)	Fibre-Length Irregularity (%)	Fibre-Weight per inch. (10-6 oz.)	Fibre-Strength (oz.)	Fibre-Strength (oz.) Fibre-Weight per inch (10-6 oz.)	Maturity test results (%) (a) Mature. (b) Half-mature. (c) Immature.	Ribbon Width. (10-8 inch.)	Convolution per inch.	Fibre-Rigidity (oz.-in. x 10-6).	Fibre-Rigidity (Fibre-Weight) x 107.	Highest Standard Warp Counts.		
1	Jayawant	1929-30	0.92	11.4	0.181	..	..	..	..	..	..	..	40
		1930-31	0.96	16.8	0.176	..	..	..	..	..	..	..	37
		1931-32	0.93	13.9	0.183	..	..	..	..	..	..	..	40
		1932-33	0.92	14.2	0.194	..	..	..	..	..	..	..	36
		1933-34	0.90	16.1	0.147	0.144	0.98	..	..	..	..	..	38
		1934-35	0.94	15.9	0.140	0.148	1.05	57-16-27	42	
		1935-36	0.94	15.8	0.150	0.152	1.01	55-24-21	42	
1936-37	0.92	13.9	0.189	0.167	0.88	84-11-5	..	..	..	..	..	41	
2	Gadag 1	1926-27	0.81	..	0.179	0.141	0.79	..	0.63	110	0.151	0.47	38		
		1927-28	0.86	..	0.167	0.148	0.89	..	0.62	115	0.152	0.55	38		
		1928-29	0.82	..	0.162	0.141	0.87	..	0.59	122	0.138	0.53	28		
		1929-30	0.84	13.0	0.148	0.140	0.95	..	0.64	140	0.157	0.72	32		
		1930-31	0.88	15.6	0.153	0.138	0.90	..	0.66	120	0.152	0.65	35		
		1931-32	0.80	15.5	0.154	0.142	0.92	..	0.60	118	0.202	0.85	29		
		1932-33	0.81	17.5	0.134	0.152	1.13	..	0.63	125	30	
		1933-34	0.81	18.1	0.153	0.124	0.81	30	
		1934-35	0.79	14.5	0.147	0.140	0.95	61-27-12	33	
		1935-36	0.84	13.9	0.162	0.151	0.93	63-26-11	30	
		1936-37	0.80	17.8	0.166	0.132	0.80	83-14-3	30	
		3	Surat 1027 A. L. F.	1926-27	0.98	..	0.200	0.172	0.85	..	0.73	96	0.162	0.40	32
				1927-28	0.94	..	0.207	0.167	0.81	..	0.74	73	0.132	0.31	30
1928-29	0.96			..	0.204	0.165	0.81	..	0.71	63	0.125	0.30	32		
1929-30	0.97			12.9	0.180	0.171	0.95	..	0.74	45	0.157	0.48	34		
1930-31	0.94			16.8	0.201	0.186	0.93	..	0.67	63	0.192	0.48	29		
1931-32	0.90			19.7	0.175	0.184	1.05	..	0.66	61	0.129	0.42	30		
1932-33	0.94			18.5	0.190	0.197	1.04	..	0.74	62	31	
1933-34	0.99			17.2	0.169	0.184	1.08	37	
1934-35	0.96			16.5	0.183	0.186	1.02	50-21-29	34	
1935-36	1.01			13.0	0.168	0.164	0.98	45-28-27	34	
1936-37	0.92			21.4	0.193	0.172	0.89	68-17-15	26	
4	Wagad 8			1926-27	0.80	..	0.264	0.178	0.67	..	0.72	45	0.221	0.32	14
				1927-28	0.77	..	0.189	0.124	0.66	..	0.72	46	0.122	0.34	15
		1928-29	0.80	..	0.239	0.144	0.60	..	0.76	58	0.135	0.24	15		
		1929-30	0.76	10.1	0.195	0.133	0.68	..	0.77	56	0.139	0.36	12		
		1930-31	0.78	11.3	0.257	0.172	0.67	..	0.77	59	0.288	0.44	12		
		1931-32	0.80	17.6	0.225	0.172	0.76	..	0.74	56	0.231	0.46	16		
		1932-33	0.84	14.1	0.240	0.172	0.72	..	0.62	79	13	
		1933-34	0.80	15.9	0.199	0.144	0.72	16	
		1934-35	0.78	14.4	0.232	0.160	0.69	48-28-24	14	
		1935-36	0.78	15.9	0.216	0.140	0.65	47-27-26	12	
		1936-37	0.81	15.2	0.221	0.158	0.71	58-19-23	13	
		5	Sind Sudhar	1930-31	0.98	19.1	0.146	42
				1931-32	0.92	19.4	0.126	42
1932-33	0.90			18.7	0.129	..	..	..	..	..	..	..	50
1933-34	1.02			16.2	0.131	..	..	..	..	..	..	..	50
1934-35	0.97			17.7	0.127	0.152	1.19	56-30-14	43	
1935-36	0.94			22.6	0.147	0.148	1.01	65-25-10	45	
1936-37	0.95			21.1	0.138	0.129	0.93	69-21-10	42	
6	Sind N. R.	1929-30	0.69	14.1	0.349	..	..	..	..	..	..	..	6
		1930-31	0.62	16.0	0.333	..	..	..	..	..	..	..	6
		1931-32	0.66	13.3	0.307	..	..	..	..	..	..	..	6
		1932-33	0.62	13.5	0.299	..	..	..	..	..	..	..	6
		1933-34	0.70	13.6	0.293	..	..	..	..	..	..	..	8
		1934-35	0.70	14.7	0.263	0.213	0.81	77-17-6	9	
		1935-36	0.69	11.8	0.257	0.176	0.68	66-28-8	7	
1936-37	0.68	13.1	0.272	0.184	0.68	85-7-8	..	..	..	..	..	7	
7	P. A. 4 F.	1926-27	0.78	..	0.134	0.132	0.99	..	0.70	104	0.093	0.52	24		
		1927-28	0.79	..	0.186	0.156	0.84	..	0.70	102	0.210	0.61	22		
		1928-29	0.76	..	0.197	0.169	0.86	..	0.68	99	0.234	0.60	26		
		1929-30	0.82	14.9	0.155	0.167	1.08	..	0.69	107	0.215	0.89	20		
		1930-31	0.77	11.5	0.199	0.182	0.92	..	0.71	110	0.226	0.58	22		
		1931-32	0.72	10.7	0.161	0.131	0.81	..	0.70	96	0.156	0.60	20		
		1932-33	0.78	14.9	0.143	0.144	1.01	..	0.74	108	25	
		1933-34	0.73	12.4	0.140	0.147	1.05	24	
		1934-35	0.82	13.3	0.142	0.136	0.96	43-27-30	27	
		1935-36	0.80	15.0	0.175	0.180	1.03	49-28-23	26	
		1936-37	0.76	15.2	0.157	0.168	1.07	55-17-28	27	
		8	P. A. 289 F.	1926-27	0.97	..	0.098	0.109	1.11	..	0.62	88	0.053	0.55	40
				1927-28	0.94	..	0.142	0.135	0.95	..	0.62	118	0.092	0.46	42
1928-29	0.96			..	0.122	0.152	1.24	..	0.68	122	0.093	0.62	39		
1929-30	1.00			16.9	0.142	0.148	1.05	..	0.61	145	0.101	0.50	42		
1930-31	0.96			20.1	0.142	0.138	0.98	..	0.62	136	0.129	0.64	44		
1931-32	0.90			17.3	0.122	0.124	1.02	..	0.59	119	0.078	0.52	39		
1932-33	0.95			22.0	0.114	0.128	1.12	..	0.60	118	0.080	0.62	44		
1933-34	0.94			19.4	0.119	0.098	0.82	45	
1934-35	0.94			19.4	0.120	0.120	1.00	54-20-26	44	
1935-36	0.97			16.1	0.152	0.168	1.11	59-28-15	45	
1936-37	0.98			20.7	0.124	0.140	1.13	38-28-34	44	
9	Mollisoni			1926-27	0.68	..	0.272	0.164	0.60	..	0.77	65	0.242	0.33	8
				1927-28	0.73	..	0.335	0.196	0.58	..	0.68	114	0.463	0.41	8
		1928-29	0.69	..	0.303	0.182	0.60	..	0.76	106	0.512	0.56	7		
		1929-30	0.69	9.8	0.272	0.167	0.61	..	0.81	87	0.386	0.52	8		
		1930-31	0.69	11.9	0.287	0.170	0.59	..	0.76	90	0.420	0.51	8		
		1931-32	0.70	11.0	0.242	0.188	0.78	..	0.72	78	0.354	0.60	8		
		1932-33	0.74	11.5	0.274	0.172	0.63	..	0.78	86	10	
		1933-34	0.68	13.6	0.282	0.190	0.98	8	
		1934-35	0.72	12.6	0.268	0.190	0.71	73-21-6	9	
		1935-36	0.75	12.2	0.264	0.186	0.71	72-21-7	8	
		1936-37	0.72	14.4	0.309	0.162	0.52	80-13-7	7	
		10	Aligarh A. 19	1926-27	0.66	..	0.301	0.188	0.62	..	0.79	80	0.361	0.40	7
				1927-28	0.70	..	0.305	0.200	0.66	..	0.82	72	0.450	0.48	7
1928-29	0.72			..	0.324	0.226	0.69	..	0.74	67	0.641	0.61	7		
1929-30	0.68			11.5	0.277	0.211	0.76	..	0.78	74	0.506	0.66	7		
1930-31	0.66			11.8	0.301	0.204	0.68	..	0.77	69	0.672	0.74	7		
1931-32	0.66			11.1	0.314	0.212	0.68	..	0.75	68	0.667	0.68	6		
1932-33	0.6														

TABLE 21 (contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-37.

A.—ENGLISH UNITS—(contd.)

Report No.	Cotton.	Season.	Fibre-length (inch.)	Fibre-length Irregularity (%)	Fibre-weight per inch. (10-6 oz.)	Fibre-strength (oz.)	Fibre-strength (oz.) + Fibre-weight per inch. (10-6 oz.)	Maturity test results (%) (a) Mature. (b) Half-mature. (c) Immature.	Ribbon Width. (10-3 inch.)	Convolution per inch.	Fibre-rigidity (oz.-in. x 10-6).	Fibre-rigidity (Fibre-weight) x 107.	Highest Standard Warp Counts.
10	Allgarh A. 19	1933-34	0.64	14.5	0.262	0.190	0.72	..	..	..	..	..	6
		1934-35	0.66	13.0	0.271	0.220	0.81	78-12-10	..	..	..	..	6
		1935-36	0.66	11.4	0.264	0.206	0.78	77-15-8	..	..	..	..	6
		1936-37	0.65	13.5	0.275	0.198	0.72	67-15-18	..	..	..	..	6
11	C 402 (U. P.)	1931-32	0.80	13.9	0.204	0.182	0.89	..	..	..	..	..	15
		1932-33	0.79	15.0	0.195	0.186	0.95	..	..	..	..	..	14
		1933-34	0.76	11.8	0.181	0.169	0.93	..	..	..	..	..	18
		1934-35	0.81	15.5	0.164	0.142	0.87	63-21-16	..	..	..	..	22
		1935-36	0.81	17.6	0.184	0.158	0.86	63-25-12	..	..	..	..	16
1936-37	0.82	15.6	0.168	0.152	0.90	63-15-22	..	..	..	..	23		
12 (a)	Verum 262 (Nagpur)	1928-29	0.86	..	0.215	0.199	0.93	..	0.62	72	0.169	0.42	26
		1929-30	0.81	12.6	0.166	0.176	1.06	..	0.64	92	0.218	0.79	21
		1930-31	0.82	12.6	0.186	0.196	1.05	..	0.61	82	0.160	0.52	26
		1931-32	0.83	15.2	0.176	0.187	1.06	..	0.63	69	0.192	0.62	25
		1932-33	0.82	14.7	0.180	0.178	0.99	..	0.63	89	0.246	0.76	23
		1933-34	0.77	15.0	0.188	0.168	0.89	..	..	..	..	..	24
		1934-35	0.83	16.1	0.183	0.191	1.04	73-14-13	..	..	..	..	28
		1935-36	0.82	18.7	0.193	0.186	0.96	65-21-14	..	..	..	..	23
		1936-37	0.80	13.5	0.182	0.150	0.82	77-13-10	..	..	..	..	25
		12 (b)	Verum 262 (Akola)	1928-29	0.84	..	0.187	0.174	0.93	..	0.63	79	0.136	0.39	23
1929-30	0.84			13.1	0.176	0.171	0.97	..	0.63	88	0.202	0.65	21
1930-31	0.80			13.1	0.170	0.168	0.99	..	0.63	79	0.237	0.82	18
1931-32	0.78			14.1	0.174	0.170	0.98	..	0.64	75	0.212	0.70	21
1932-33	0.82			13.1	0.163	0.150	0.92	..	0.62	86	0.190	0.72	25
1933-34	0.80			15.2	0.184	0.168	0.91	..	..	..	..	..	21
1934-35	0.80			16.9	0.165	0.179	1.08	69-17-14	..	..	..	..	22
1935-36	0.80			18.7	0.195	0.181	0.93	59-28-13	..	..	..	..	20
1936-37	0.79			15.4	0.195	0.177	0.91	53-26-21	..	..	..	..	23
13	V434 Akola			1933-34	0.88	13.6	0.172	0.210	1.22
		1934-35	0.84	15.0	0.167	0.159	0.95	61-17-22	..	..	..	..	30
		1935-36	0.87	15.0	0.170	0.176	1.04	62-26-12	..	..	..	..	31
		1936-37	0.86	11.8	0.179	0.179	1.00	63-25-12	..	..	..	..	27
14	Late Verum (Nagpur)	1930-31	0.89	14.2	0.184	0.162	0.88	..	..	..	..	..	30
		1931-32	0.88	13.8	0.181	..	..	..	..	..	..	..	29
		1932-33	0.86	12.8	0.184	..	..	..	..	..	..	..	31
		1933-34	0.87	16.1	0.175	0.191	1.09	..	..	..	..	..	34
		1934-35	0.86	16.1	0.189	0.178	0.94	70-14-16	..	..	..	..	36
		1935-36	0.86	16.6	0.186	0.186	1.00	67-20-13	..	..	..	..	33
1936-37	0.87	12.6	0.176	0.192	1.09	63-19-18	..	..	..	..	31		
15	Umri Bani	1926-27	0.82	..	0.200	0.186	0.93	..	0.67	65	0.160	0.40	24
		1927-28	0.82	..	0.192	0.180	0.94	..	0.63	93	0.188	0.51	24
		1928-29	0.84	..	0.185	0.176	0.96	..	0.63	88	0.196	0.57	22
		1929-30	0.81	14.8	0.152	0.172	1.13	..	0.64	90	0.185	0.40	27
		1930-31	0.80	14.0	0.175	0.176	1.01	..	0.67	122	0.189	0.62	28
		1931-32	0.79	13.7	0.172	0.164	0.95	..	0.66	92	0.254	0.86	27
		1932-33	0.81	17.9	0.175	0.165	0.95	..	0.65	87	0.181	0.59	28
		1933-34	0.83	13.9	0.166	0.191	1.15	..	0.68	77	0.178	0.65	29
		1934-35	0.82	16.3	0.169	0.172	1.01	67-15-18	..	..	..	..	30
		1935-36	0.82	12.3	0.160	0.178	1.12	63-19-18	..	..	..	..	34
1936-37	0.82	16.6	0.188	0.158	0.84	61-18-21	..	..	..	..	30		
16	Cambodia Co. 2 (440)	1927-28	0.88	..	0.141	0.123	0.87	..	0.62	108	0.138	0.69	33
		1928-29	0.92	..	0.148	0.100	0.67	..	0.61	90	0.099	0.45	26
		1929-30	0.90	17.0	0.136	0.124	0.91	..	0.64	116	0.224	1.21	28
		1930-31	0.92	19.7	0.133	0.116	0.88	..	0.66	94	0.145	0.62	29
		1931-32	0.90	18.6	0.145	0.116	0.80	..	0.63	87	0.148	0.70	27
		1932-33	0.92	18.7	0.123	0.098	0.78	..	0.68	119	..	..	24
		1933-34	0.88	22.5	0.122	0.098	0.80	..	..	..	..	..	26
		1934-35	0.92	19.4	0.132	0.126	0.96	40-15-45	..	..	..	..	30
		1935-36	0.88	19.4	0.152	0.124	0.81	46-27-27	..	..	..	..	30
		1936-37	0.92	19.7	0.136	0.126	0.93	50-21-29	..	..	..	..	33
17	Nandyal 14	1926-27	0.94	..	0.191	0.223	1.17	..	0.61	46	0.142	0.39	34
		1927-28	0.88	..	0.196	0.230	1.17	..	0.61	56	0.147	0.38	31
		1928-29	0.92	..	0.187	0.236	1.26	..	0.65	60	0.169	0.48	31
		1929-30	0.92	15.9	0.169	0.232	1.38	..	0.65	70	0.169	0.59	35
		1930-31	0.86	14.7	0.167	0.210	1.25	..	0.67	67	0.137	0.49	35
		1931-32	0.85	16.4	0.187	0.226	1.21	..	0.64	60	0.160	0.46	30
		1932-33	0.91	13.6	0.156	0.222	1.42	..	0.67	80	..	..	37
		1933-34	0.89	13.6	0.163	0.222	1.36	..	..	..	..	..	37
		1934-35	0.94	14.2	0.171	0.225	1.32	64-23-13	..	..	..	..	40
		1935-36	0.92	16.0	0.153	0.212	1.39	64-22-14	..	..	..	..	40
1936-37	0.86	16.1	0.163	0.226	1.39	76-11-13	..	..	..	..	42		
18	Hagari 1	1929-30	0.84	..	0.207	0.140	0.68	..	0.65	78	0.164	0.38	24
		1930-31	0.84	13.8	0.175	0.128	0.73	..	0.71	88	0.129	0.42	27
		1931-32	0.91	10.1	0.166	0.156	0.94	..	0.66	74	0.128	0.46	30
		1932-33	0.86	14.8	0.172	0.164	0.90	..	0.65	74	0.133	0.45	30
		1933-34	0.82	16.3	0.175	0.146	0.84	..	0.70	98	..	..	25
		1934-35	0.80	15.9	0.171	0.130	0.76	..	..	..	..	..	28
		1935-36	0.83	15.5	0.167	0.130	0.78	53-28-19	..	..	..	..	29
		1936-37	0.90	14.4	0.170	0.142	0.83	65-25-10	..	..	..	..	30
19	Karunganni	1926-27	0.85	..	0.192	0.184	0.95	..	0.65	57	0.170	0.46	24
		1927-28	0.85	..	0.183	0.177	0.97	..	0.62	62	0.156	0.47	24
		1928-29	0.82	..	0.186	0.160	0.85	..	0.70	74	0.184	0.53	20
		1929-30	0.84	16.4	0.181	0.171	0.94	..	0.78	50	0.215	0.66	23
		1930-31	0.82	16.6	0.161	0.157	0.98	..	0.66	71	0.119	0.46	26
		1931-32	0.82	17.1	0.181	0.190	1.05	..	0.67	70	0.196	0.60	21
		1932-33	0.86	15.5	0.167	0.202	1.21	..	0.69	70	..	..	23
		1933-34	0.82	18.6	0.164	0.198	1.21	..	..	..	..	..	25
		1934-35	0.83	17.4	0.167	0.194	1.16	52-16-32	..	..	..	..	24
		1935-36	0.83	16.6	0.157	0.184	1.04	55-19-20	..	..	..	..	23
1936-37	0.84	16.3	0.170	0.194	1.14	65-16-19	..	..	..	..	34		
20	Kollpatti 1	1936-37	0.85	17.0	0.146	0.171	1.17	69-14-17	..	..	..	..	30

TABLE 21 (contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-37.

B.—METRIC UNITS.

Report No.	Cotton.	Season.	Fibre- Length (mm.)	Fibre- Length Irregu- larity (%).	Fibre- Weight per cm. (10-5 gm.)	Fibre- Strength (gm.)	Fibre- Strength (gm.) + Fibre- Weight (10-5 gm.)	Maturity test results (%) (a) Mature. (b) Half- mature. (c) Im- mature.	Ribbon Width. (10-3 cm.)	Convolu- tions per cm.	Fibre- Rigidity (10-3 dynes x cm. 2)	Fibre- Rigidity + (Fibre- Weight) x 1010.	Highest Standard Warp Counts.		
1	Jayawant	1929-30	23.5	11.4	2.01	..	..	..	..	..	..	..	40
		1930-31	24.3	16.3	1.95	..	..	..	..	..	..	..	37
		1931-32	23.6	13.9	2.05	..	..	..	..	..	..	..	40
		1932-33	23.2	14.2	2.17	..	..	..	..	..	..	..	36
		1933-34	23.0	16.1	1.64	4.08	2.49	..	..	..	..	..	38
		1934-35	23.9	15.9	1.56	4.18	2.68	57-16-27	..	..	..	..	42
		1935-36	23.8	15.8	1.67	4.31	2.54	55-24-21	..	..	..	..	42
		1936-37	23.5	13.9	2.11	4.74	2.24	84-11-5	..	..	..	..	41
		2	Gadag 1	1926-27	20.6	..	2.00	4.00	2.00	..	1.60	43	2.68	0.67	38
				1927-28	21.8	..	1.87	4.20	2.25	..	1.57	45	2.72	0.78	38
1928-29	21.0			..	1.82	4.00	2.19	..	1.50	49	2.47	0.75	26		
1929-30	21.4			13.0	1.65	3.99	2.42	..	1.64	55	2.80	1.03	32		
1930-31	22.2			15.6	1.71	3.92	2.29	..	1.67	47	2.73	0.93	35		
1931-32	20.2			15.5	1.72	4.04	2.35	..	1.54	46	3.63	1.23	29		
1932-33	20.6			17.5	1.49	4.30	2.88	..	1.60	49	..	..	30
1933-34	20.6			18.1	1.71	3.52	2.06	..	..	..	..	..	30
1934-35	20.1			14.5	1.63	3.98	2.44	61-27-12	..	..	..	..	33
1935-36	21.2			13.9	1.80	4.28	2.34	63-26-11	..	..	..	..	30
1936-37	20.4			17.8	1.86	3.75	2.02	83-14-8	..	..	..	..	30
3	Surat 1027 A. L. F.			1926-27	24.8	..	2.23	4.86	2.17	..	1.85	38	2.90	0.58	32
				1927-28	24.0	..	2.32	4.74	2.04	..	1.88	29	2.38	0.44	30
				1928-29	24.4	..	2.28	4.67	2.05	..	1.81	25	2.25	0.43	32
		1929-30	24.6	12.9	2.01	4.86	2.42	..	1.88	18	2.81	0.70	34		
		1930-31	23.8	16.8	2.24	5.30	2.37	..	1.71	25	3.43	0.68	29		
		1931-32	22.8	19.7	1.96	5.22	2.66	..	1.67	24	2.30	0.60	30		
		1932-33	23.9	18.5	2.12	5.58	2.64	..	1.88	24	..	..	31
		1933-34	25.2	17.2	1.88	5.20	2.77	..	..	..	..	..	27
		1934-35	24.2	16.5	2.04	5.27	2.58	50-21-29	..	..	..	..	34
		1935-36	25.0	13.0	1.88	4.65	2.48	45-23-27	..	..	..	..	34
		1936-37	23.4	21.4	2.15	4.89	2.27	68-17-15	..	..	..	..	26
		4	Wagad 8	1926-27	20.4	..	2.95	5.06	1.71	..	1.83	18	3.97	0.46	14
				1927-28	19.6	..	2.10	3.52	1.68	..	1.82	18	2.18	0.49	15
				1928-29	20.4	..	2.67	4.06	1.52	..	1.93	23	2.42	0.34	15
1929-30	19.2			10.1	2.18	3.77	1.73	..	1.96	22	2.49	0.52	12		
1930-31	19.8			11.3	2.87	4.90	1.70	..	1.94	23	5.16	0.63	12		
1931-32	20.4			17.6	2.52	4.88	1.93	..	1.88	22	4.14	0.65	16		
1932-33	21.2			14.1	2.67	4.88	1.83	..	2.08	31	..	..	13
1933-34	20.2			15.9	2.22	4.07	1.83	..	..	..	..	..	16
1934-35	20.0			14.4	2.60	4.54	1.74	48-23-24	..	..	..	..	14
1935-36	19.7			15.9	2.40	3.97	1.65	47-27-26	..	..	..	..	12
1936-37	20.6			15.2	2.46	4.48	1.82	58-19-23	..	..	..	..	13
5	Sind Sudhar			1930-31	24.8	19.1	1.63	42
				1931-32	23.4	19.4	1.41	42
				1932-33	23.0	18.7	1.43	50
		1933-34	26.0	16.2	1.46	..	..	..	..	..	..	..	50
		1934-35	24.6	17.7	1.41	4.30	3.05	56-30-14	..	..	..	..	43
		1935-36	23.8	22.6	1.65	4.21	2.58	65-25-10	..	..	..	..	45
		1936-37	24.2	21.1	1.54	3.66	2.38	69-21-10	..	..	..	..	42
		6	Sind N. E.	1929-30	17.6	14.1	3.89	6
				1930-31	15.8	16.0	3.71	6
				1931-32	17.3	13.3	3.43	6
1932-33	15.8			13.5	3.34	..	..	..	..	..	..	..	6
1933-34	17.9			13.6	3.27	..	..	..	..	..	..	..	8
1934-35	17.6			14.7	2.93	6.02	2.05	77-17-6	..	..	..	..	9
1935-36	17.6			11.8	2.87	5.00	1.74	66-26-8	..	..	..	..	7
1936-37	17.4			13.1	3.02	5.21	1.73	85-7-8	..	..	..	..	7
7	P. A. 4. F.			1926-27	19.8	..	1.50	3.74	2.49	..	1.78	41	1.67	0.74	24
				1927-28	20.1	..	2.07	4.44	2.14	..	1.80	40	3.78	0.88	22
		1928-29	19.3	..	2.20	4.78	2.17	..	1.74	39	4.19	0.87	16		
		1929-30	20.7	14.9	1.73	4.73	2.73	..	1.76	42	3.85	1.29	20		
		1930-31	19.6	11.5	2.21	5.15	2.83	..	1.80	43	4.06	0.83	22		
		1931-32	18.4	10.7	1.80	3.72	2.07	..	1.78	38	2.78	0.86	20		
		1932-33	19.7	14.9	1.59	4.08	2.57	..	1.89	43	..	..	25
		1933-34	18.6	12.4	1.56	4.14	2.65	..	..	..	..	..	24
		1934-35	20.7	13.3	1.59	3.87	2.43	43-27-30	..	..	..	..	27
		1935-36	20.4	15.0	1.96	5.12	2.61	49-23-23	..	..	..	..	26
		1936-37	19.3	15.2	1.75	4.75	2.71	55-17-28	..	..	..	..	27
		8	P. A. 289F	1926-27	24.6	..	1.10	3.10	2.81	..	1.57	35	0.66	0.79	40
				1927-28	23.8	..	1.59	3.84	2.42	..	1.59	47	1.64	0.65	42
				1928-29	24.5	..	1.36	4.28	3.15	..	1.48	48	1.67	0.90	39
1929-30	25.4			16.9	1.58	4.22	2.67	..	1.54	57	1.82	0.73	42		
1930-31	24.4			20.1	1.59	3.92	2.46	..	1.59	53	2.31	0.91	44		
1931-32	22.8			17.3	1.36	3.53	2.80	..	1.50	47	1.40	0.76	39		
1932-33	24.2			22.0	1.28	3.61	2.82	..	1.51	47	1.44	0.88	44		
1933-34	23.9			19.4	1.32	2.77	2.10	..	..	..	..	..	45
1934-35	24.0			19.4	1.33	3.40	2.56	54-20-26	..	..	..	..	44
1935-36	24.6			16.1	1.70	4.76	2.80	59-26-15	..	..	..	..	45
1936-37	24.2			20.7	1.38	3.98	2.88	38-28-34	..	..	..	..	44
9	Mollison			1926-27	17.4	..	3.04	4.66	1.53	..	1.96	26	4.33	0.46	8
				1927-28	18.5	..	3.74	5.54	1.48	..	2.22	45	8.29	0.59	7
				1928-29	17.8	..	3.38	5.16	1.53	..	1.93	42	9.16	0.80	7
		1929-30	17.6	9.8	3.04	4.74	1.56	..	2.05	34	6.92	0.75	8		
		1930-31	17.6	11.9	3.20	4.83	1.51	..	1.93	36	7.51	0.73	8		
		1931-32	17.6	11.0	2.71	5.33	1.97	..	1.64	31	6.35	0.86	8		
		1932-33	18.6	11.5	3.06	4.88	1.60	..	1.99	34	..	..	10
		1933-34	17.4	13.6	3.14	5.40	1.72	..	..	..	..	..	8
		1934-35	18.2	12.6	2.98	5.38	1.81	73-21-6	..	..	..	..	9
		1935-36	19.0	12.2	2.96	5.30	1.79	72-21-7	..	..	..	..	8
		1936-37	18.2	14.4	3.44	4.68	1.33	80-13-7	..	..	..	..	7
		10	Allgarh A. 19	1926-27	16.8	..	3.37	5.33	1.58	..	2.01	31	6.46	0.57	7
				1927-28	17.8	..	3.40	5.61	1.65	..	2.10	28	8.06	0.70	7
				1928-29	18.2	..	3.63	6.39	1.76	..	1.89	27	11.50	0.87	7
1929-30	17.4			11.5	3.09	6.00	1.94	..	2.00	29	9.05	0.95	7		
1930-31	16.8			11.8	3.36	5.80	1.72	..	1.94	27	12.03	1.07	7		
1931-32	16.9			11.1	3.50	6.00	1.72	..	1.90	27	11.94	0.97	6		

TABLE 21 (contd.)—FIBRE PROPERTIES OF STANDARD INDIAN COTTONS, 1926-37.

B.—METRIC UNITS—(contd.)

Report No.	Cotton.	Season.	Fibre Length (mm.)	Fibre Length Irregularity (%)	Fibre Weight per cm. (10-6gm.)	Fibre Strength (gm.)	Fibre Strength + Fibre Weight (10-6 gm.)	Maturity test results (%) (a) Mature, (b) Half-mature, (c) Immature.	Ribbon Width. (10-9 cm.)	Convulsions per cm.	Fibre Rigidity (10 ⁻² dynes x cm ² .)	Fibre Rigidity + (Fibre Weight) ² x 10 ¹⁰ .	Highest Standard Warp Counts.	
10	Aligarh A. 19	1932-33	17.0	12.5	3.24	6.52	2.01	..	2.01	92	..	..	6
		1933-34	16.3	14.5	2.93	5.38	1.84	..	..	..	..	..	6
		1934-35	16.8	13.0	3.02	6.24	2.07	78-12-10	..	..	..	..	6
		1935-36	16.8	11.4	2.93	5.84	1.99	77-15-8	..	..	..	..	6
		1936-37	16.6	13.5	3.08	5.62	1.82	67-15-18	..	..	..	..	6
11	C. 402 (U. P.)	1931-32	20.3	13.9	2.28	5.17	2.27	..	..	..	..	..	15
		1932-33	20.0	15.0	2.18	5.26	2.41	..	..	..	..	..	14
		1933-34	19.2	11.8	2.02	4.80	2.37	..	..	..	..	..	18
		1934-35	20.6	15.5	1.83	4.04	2.20	63-21-16	..	..	..	..	22
		1935-36	20.6	17.6	2.06	4.46	2.16	63-25-12	..	..	..	..	16
1936-37	20.8	15.6	1.88	4.80	2.29	63-15-22	..	..	..	..	23		
12 (a)	Verum 262 (Nagpur)	1928-29	21.7	..	2.40	5.64	2.35	..	1.58	28	3.46	0.60	26	
		1929-30	20.6	12.6	1.85	4.98	2.69	..	1.64	36	3.91	1.14	21	
		1930-31	21.0	12.6	2.07	5.56	2.68	..	1.54	32	3.22	0.75	26	
		1931-32	21.0	15.2	1.97	5.30	2.69	..	1.60	27	3.43	0.88	25	
		1932-33	21.0	14.7	2.01	5.04	2.51	..	1.59	35	4.40	1.09	23	
		1933-34	19.6	15.0	2.09	4.76	2.28	24
		1934-35	21.0	16.1	2.04	5.42	2.66	79-14-13	25
		1935-36	21.0	18.7	2.15	5.27	2.45	65-21-14	25
		1936-37	20.3	13.5	2.04	4.26	2.08	77-13-10	25
		1936-37	20.3	13.5	2.04	4.26	2.08	77-13-10	25
12 (b)	Verum 262 (Akola)	1928-29	21.2	..	2.08	4.95	2.38	..	1.60	31	2.43	0.56	28	
		1929-30	21.4	13.1	1.98	4.85	2.47	..	1.61	35	3.68	0.94	18	
		1930-31	20.2	13.1	1.90	4.77	2.51	..	1.60	31	4.25	1.18	21	
		1931-32	19.7	14.1	1.94	4.84	2.49	..	1.64	29	3.80	1.01	21	
		1932-33	21.0	13.1	1.82	4.26	2.34	..	1.58	34	5.40	1.03	25	
		1933-34	20.3	15.2	2.06	4.76	2.81	21
		1934-35	20.2	16.9	1.84	5.08	2.76	69-17-14	22
		1935-36	20.4	18.7	2.19	5.13	2.39	59-23-13	20
		1936-37	20.1	15.4	2.18	5.01	2.30	53-26-21	23
		1936-37	20.1	15.4	2.18	5.01	2.30	53-26-21	23
13	V. 434 (Akola)	1933-34	22.2	13.6	1.92	5.94	3.10	..	..	..	..	..	25
		1934-35	21.2	15.0	1.85	4.50	2.44	61-17-22	..	..	..	..	30
		1935-36	22.1	15.0	1.90	5.00	2.63	62-26-12	..	..	..	..	31
		1936-37	21.8	11.8	2.01	5.08	2.52	63-25-12	..	..	..	..	27
		1936-37	21.8	11.8	2.01	5.08	2.52	63-25-12	..	..	..	..	27
14	Late Verum (Nagpur)	1930-31	22.8	14.2	2.06	4.60	2.23	..	..	..	..	..	30
		1931-32	22.5	13.8	2.02	..	..	..	..	..	..	..	29
		1932-33	22.0	12.8	2.05	..	..	..	..	..	..	..	31
		1933-34	22.1	16.1	1.95	5.41	2.77	..	..	..	..	..	34
		1933-34	22.1	16.1	1.95	5.41	2.77	..	..	..	..	..	34
1934-35	21.8	16.1	2.10	5.05	2.40	70-14-16	..	..	..	..	..	36	
1935-36	21.7	16.6	2.08	5.27	2.53	67-20-13	..	..	..	..	..	33	
1936-37	22.1	12.6	1.96	5.42	2.76	63-19-18	..	..	..	..	..	31	
1936-37	22.1	12.6	1.96	5.42	2.76	63-19-18	..	..	..	..	..	31	
15	Umri Bani	1926-27	20.7	..	2.23	5.28	2.37	..	1.70	26	2.87	0.58	24	
		1927-28	20.7	..	2.15	5.10	2.37	..	1.60	37	3.33	0.73	24	
		1928-29	21.2	..	2.07	5.02	2.42	..	1.61	34	3.52	0.82	22	
		1929-30	20.6	14.8	1.70	4.88	2.80	..	1.62	36	3.81	1.15	27	
		1930-31	20.4	14.0	1.96	5.00	2.55	..	1.70	48	3.39	0.88	28	
		1931-32	20.1	13.7	1.92	4.64	2.41	..	1.68	36	4.55	1.23	27	
		1932-33	20.6	17.9	1.95	4.68	2.40	..	1.65	34	3.24	0.85	28	
		1933-34	21.0	13.9	1.85	5.40	2.92	..	1.71	30	3.20	0.94	29	
		1934-35	20.7	16.3	1.88	4.87	2.59	67-15-18	30
		1935-36	20.7	12.3	1.80	5.06	2.81	63-19-18	34
1936-37	20.8	16.6	2.10	4.48	2.13	61-18-21	..	..	..	..	..	30	
1936-37	20.8	16.6	2.10	4.48	2.13	61-18-21	..	..	..	..	..	30	
16	Cambodia Co. 2 (440)	1927-28	22.5	..	1.57	3.48	2.22	..	1.60	43	2.47	1.00	33	
		1928-29	23.4	..	1.65	2.83	1.71	..	1.56	35	1.77	0.65	26	
		1929-30	22.8	17.0	1.51	3.50	2.32	..	1.63	46	4.02	1.76	28	
		1930-31	23.5	19.7	1.48	3.32	2.24	..	1.66	37	2.60	1.19	29	
		1931-32	23.0	18.6	1.62	3.30	2.03	..	1.60	34	2.64	1.00	27	
		1932-33	23.5	18.7	1.38	2.72	1.97	..	1.72	47	24
		1933-34	22.4	22.5	1.36	2.77	2.04	26
		1934-35	23.4	19.4	1.47	3.59	2.44	40-15-45	30
		1935-36	22.4	19.4	1.70	3.50	2.06	46-27-27	30
		1936-37	23.4	19.7	1.51	3.58	2.35	50-21-29	33
1936-37	23.4	19.7	1.51	3.58	2.35	50-21-29	..	..	..	..	..	33	
17	Nandyal 14	1926-27	23.8	..	2.13	6.32	2.97	..	1.55	18	2.55	0.56	34	
		1927-28	22.4	..	2.18	6.50	2.98	..	1.72	22	2.64	0.56	31	
		1928-29	23.2	..	2.08	6.71	3.23	..	1.66	24	3.02	0.70	31	
		1929-30	23.2	15.9	1.89	6.60	3.49	..	1.66	27	3.03	0.85	35	
		1930-31	22.0	14.7	1.86	5.94	3.19	..	1.70	26	2.46	0.71	35	
		1931-32	21.6	16.4	2.09	6.43	3.08	..	1.62	24	2.88	0.66	30	
		1932-33	23.2	13.6	1.74	6.30	3.02	..	1.71	32	37
		1933-34	22.6	13.6	1.82	6.28	3.45	37
		1934-35	23.8	14.2	1.91	6.38	3.34	64-23-13	40
		1935-36	23.2	16.0	1.71	6.02	3.52	64-22-14	40
1936-37	22.0	16.1	1.82	6.40	3.52	70-11-13	..	..	..	..	..	42	
1936-37	22.0	16.1	1.82	6.40	3.52	70-11-13	..	..	..	..	..	42	
18	Hagari 1	1928-29	21.4	..	2.31	3.96	1.72	..	1.65	31	2.94	0.55	24	
		1929-30	21.3	13.8	1.96	3.64	1.85	..	1.79	35	2.32	0.60	27	
		1930-31	23.1	10.1	1.86	4.42	2.38	..	1.67	29	2.29	0.66	36	
		1931-32	22.0	14.8	1.92	4.38	2.24	..	1.64	29	2.38	0.65	30	
		1932-33	21.0	16.3	1.96	4.16	2.12	..	1.77	37	25
		1933-34	20.3	15.9	1.91	3.70	1.92	28
		1934-35	21.0	15.5	1.87	3.69	1.97	53-23-19	29
		1935-36	22.8	14.4	1.90	4.02	2.12	65-25-10	30
		1936-37	21.8	12.2	2.02	4.02	1.99	79-15-6	30
		1936-37	21.8	12.2	2.02	4.02	1.99	79-15-6	30
19	Karunganni C 7	1926-27	21.6	..	2.15	5.20	2.42	..	1.65	22	3.05	0.66	24	
		1927-28	21.6	..	2.05	5.04	2.40	..	1.58	24	2.80	0.67	24	
		1928-29	20.7	..	2.09	4.51	2.16	..	1.79	29	3.30	0.70	20	
		1929-30	21.2	16.4	2.02	4.86	2.40	..	1.98	20	3.84	0.94	23	
		1930-31	20.8	16.6	1.80	4.45	2.47	..	1.68	28	2.13	0.60	26	
		1931-32	20.8	17.1	2.02	5.38	2.60							

TABLE 22—SUMMARY OF SPINNING TEST RESULTS FOR STANDARD INDIAN COTTONS, 1923-37.
(a) BOMBAY AND SIND COTTONS.

1 Sample No.	2 Cotton.	3 Season.	4 Counts Nominal.	5 WASTE PERCENTAGES.				6 RING FRAME PARTICULARS.*					7 YARN TEST RESULTS.											28 TEMPERATURE (°F.)	29 RELATIVE HUMIDITY (%)		33 Highest Standard Warp Counts.					
				8 Blow Room Loss.	9 Card Room Loss.	10 Spinning Loss.	11 Total Loss.	12 Yarn Breakages per 100 spindles per hour.	13 Front Roller Speed R. P. M.	14 Draft.	15 Turns per inch.	16 LEA.				17 BALLISTIC.			18 SINGLE THREAD.							30 Spinning Room.		31 Spinning Room.		32 Testing Room.		
												19 Counts Actual.	20 Strength (lbs.)	21 Strength Irregularity (%)	22 Count-strength Product.	23 Counts Actual.	24 Work of Rupture (inch-lbs.)	25 Work Irregularity (%)	26 Count-work Product.	27 Counts.	28 Strength (ozs.)	29 Strength Irregularity (%)	30 Weakness Percentage.		31 Extension (%)			32 Extension Irregularity (%)	33 Evenness Class.		34 Neps per yard.	35 Turns per inch Actual.	36 Spinning Room.	37 Testing Room.
593	Jayawant	1926-28	20	8.5	7.0	0.3	10.5	6	189	4.59	16.85	19.6	102.1	5.0	2,001	..	..	..	20.3	13.8	9.8	1.8	6.7	7.4	3	1.3	16.4	86	69	66	34
840	"	1924-29	20	3.2	7.5	0.1	10.6	2	192	4.59	16.85	19.3	108.2	4.6	2,088	..	..	..	19.7	15.0	9.1	1.5	6.3	6.7	3	1.1	16.3	88	62	55	28
1083	"	1929-30	20	3.6	5.5	0.7	9.6	2	196	4.63	17.98	20.0	119.9	5.0	2,398	..	..	..	21.0	15.1	9.7	2.0	6.7	10.4	3	1.7	17.2	88	67	72	40
1377	"	1930-31	20	12.2	6.3	0.3	9.7	0	197	6.10	17.98	19.8	103.4	3.9	2,047	..	..	..	19.9	14.2	8.4	2.0	7.0	8.0	3	1.0	17.4	93	67	65	37
2015	"	1931-32	20	3.1	6.4	0.4	9.8	10	195	5.95	17.98	19.2	112.0	3.0	2,162	..	..	..	20.3	15.2	9.5	2.0	6.7	8.0	3	1.0	17.6	89	69	76	40
2116	"	1932-33	20	3.1	6.0	0.2	9.3	16	195	5.95	17.98	19.7	104.3	2.9	2,055	..	..	..	19.7	14.8	9.5	2.0	6.6	10.5	3	1.0	17.4	85	68	71	36
2762	"	1933-34	20	4.4	8.9	0.2	11.2	16	202	6.07	17.98	20.5	101.2	4.4	2,075	20.7	142.6	3.3	2952	20.6	13.8	8.5	2.0	6.2	10.1	3	1.2	17.4	84	82	72	32
3176	"	1934-35	20	4.4	8.9	0.2	11.2	16	197	4.39	17.98	19.4	123.8	4.4	2,402	18.5	193.9	4.2	3879	19.4	17.4	8.8	1.0	7.9	6.4	3	1.2	17.0	88	74	74	42
3678	"	1935-36	20	4.4	8.9	0.2	11.2	16	193	4.30	17.98	20.4	117.8	3.4	2,403	20.6	160.3	4.2	3302	20.6	15.6	8.2	0.5	6.6	7.0	3	1.2	17.2	89	87	73	42
	"	1936-37	20	5.9	7.9	0.4	10.9	13	208	4.30	17.98	20.0	115.0	3.9	2,300	20.0	156.6	4.4	3132	19.9	10.6	2.0	7.3	6.7	3	0.6	17.2	86	78	83	41	
513	Gadag 1	1923-23	20	6.8	7.0	0.6	14.7	12	186	4.56	16.85	19.6	83.0	5.7	1,627	..	..	..	20.1	11.3	10.1	2.4	5.9	10.2	3	3.1	16.2	88	70	66	32
719	"	1924-29	20	8.7	8.6	0.6	17.1	41	191	4.30	16.85	20.2	71.0	5.8	1,434	20.1	116.8	..	2350	20.4	10.3	3.7	6.3	7.2	3	2.1	16.4	91	63	69	26	
1013	"	1929-30	20	11.2	3.6	0.3	13.3	10	196	4.76	16.85	19.8	86.2	4.5	1,707	20.2	121.7	..	2519	20.2	12.1	3.5	7.7	8.0	3	3.0	16.9	90	65	63	32	
1746	"	1930-31	20	7.5	7.0	0.5	15.3	18	197	4.65	17.98	20.0	95.0	4.2	1,900	20.4	134.0	..	2734	19.9	13.0	1.2	7.5	7.7	3	2.2	17.7	86	70	62	35	
2261	"	1931-32	20	5.6	8.8	0.6	14.4	7	195	4.48	16.85	19.5	80.2	4.4	1,564	20.0	127.2	..	2544	19.8	10.8	2.2	7.2	8.2	3	1.9	16.9	85	70	69	29	
2707	"	1932-33	20	7.6	9.6	0.4	16.8	39	196	4.53	16.85	20.0	83.1	4.6	1,629	19.6	139.4	..	2730	20.0	11.6	1.2	7.8	5.6	3	1.6	16.8	88	63	70	30	
3135	"	1933-34	20	5.0	8.6	0.4	14.2	13	195	4.53	16.85	19.6	77.1	6.2	1,542	20.0	117.9	..	2858	20.2	11.4	1.2	5.2	10.4	3	0.8	16.1	89	64	62	30	
3619	"	1934-35	20	4.6	8.8	0.5	13.4	5	196	4.63	16.85	20.0	90.8	4.5	1,810	20.0	152.6	..	3052	20.8	12.2	1.8	7.0	10.2	3	1.3	16.0	81	69	66	33	
	"	1935-36	20	6.6	7.2	0.4	13.7	8	183	4.54	16.85	19.6	83.0	5.6	1,627	19.6	138.0	..	2705	10.8	12.0	5.0	6.8	9.4	3	0.8	16.2	89	67	70	30	
	"	1936-37	20	7.8	7.5	0.4	15.2	50	208	4.30	16.85	19.5	85.4	5.4	1,665	19.6	139.2	..	2728	20.1	11.8	3.5	7.2	7.8	3	0.9	16.2	90	68	78	30	
487	Surat 1927 A.L.F.	1923-28	20	5.3	7.5	0.4	12.8	7	185	4.33	16.85	19.7	82.2	6.0	1,619	..	..	..	20.3	11.0	9.7	1.5	5.8	9.0	3	2.1	16.3	86	66	61	30
716	"	1924-29	20	4.6	7.5	0.2	11.9	17	190	4.44	16.85	19.5	95.8	4.2	1,808	19.8	133.6	..	2645	19.9	12.5	9.2	7.0	7.0	3	3.3	16.3	88	68	67	32	
1018	"	1929-30	20	3.3	7.4	0.3	10.8	7	196	4.55	16.85	19.4	97.1	5.0	1,884	19.3	130.1	..	2570	20.0	11.8	11.9	5.7	6.6	7.3	3	2.6	16.3	91	58	62	34
1313	"	1930-31	20	3.6	6.0	0.6	10.6	8	200	4.49	16.85	19.9	81.2	4.9	1,616	20.2	119.0	..	2404	20.9	9.8	11.7	3.7	6.3	7.4	3	2.1	16.2	89	68	64	29
1735	"	1931-32	20	4.7	6.8	0.5	11.6	15	196	4.32	16.85	19.7	83.1	5.4	1,637	20.1	122.6	..	2464	20.2	11.2	11.1	4.7	6.4	9.6	3	2.0	16.4	89	68	68	30
2244	"	1932-33	20	3.6	7.4	0.6	11.3	39	196	4.36	17.98	19.8	93.1	5.0	1,843	19.6	144.1	..	2824	20.4	12.2	10.8	3.8	7.1	8.2	3	1.0	17.4	89	65	68	31
2761	"	1933-34	20	3.6	8.8	0.4	10.4	26	203	4.35	16.85	19.4	106.0	5.6	2,056	19.4	147.8	..	2867	19.6	13.8	11.0	2.8	6.5	8.6	3	1.1	16.0	87	70	76	34
3157	"	1934-35	20	5.6	9.3	0.5	14.8	10	192	4.22	16.85	19.3	102.4	4.6	2,028	19.2	162.8	..	3120	20.0	13.9	9.9	2.0	7.3	8.8	3	3.1	16.0	89	70	70	34
3594	"	1935-36	20	3.0	5.8	0.4	9.0	7	184	4.46	16.85	19.8	97.2	4.2	1,924	20.0	129.4	..	2588	20.0	12.0	9.8	1.0	6.9	8.6	3	1.9	16.0	89	70	70	34
	"	1936-37	20	5.2	6.9	0.4	12.0	13	203	4.21	16.85	19.6	78.0	7.2	1,529	19.6	125.4	..	2458	20.0	11.1	12.1	4.2	6.6	9.8	3	2.6	16.2	90	68	68	26
404	Wazir 8	1926-28	14	8.2	9.0	0.2	16.3	2	179	6.24	15.08	14.3	88.6	5.3	1,267	..	..	..	14.6	11.8	11.4	4.1	8.2	8.2	3	2.6	14.8	88	70	71	14
698	"	1924-29	14	5.4	7.6	0.2	12.8	10	194	5.74	15.08	14.3	92.4	4.8	1,321	10.5	253.8	..	2665	14.8	12.5	9.0	1.5	8.2	7.2	3	1.2	14.5	80	65	71	15
1008	"	1929-30	14	7.8	9.7	0.2	16.9	23	192	5.21	15.08	14.2	75.2	5.8	1,068	10.1	236.6	..	2390	14.7	11.2	13.0	7.5	7.7	8.7	4	3.3	14.6	80	65	67	12
1300	"	1930-31	14	10.4	8.3	0.4	18.2	16	195	5.42	15.08	13.8	74.4	5.9	1,022	10.2	228.2	..	2328	14.0	11.6	10.0	1.5	7.9	8.1	4	0.8	14.2	80	63	66	12
1774	"	1931-32	14	7.9	8.3	0.3	15.8	9	198	4.68	15.08	13.6	106.8	4.2	1,452	13.8	135.4	..	2550	14.0	14.8	10.1	1.8	8.4	6.8	4	1.0	14.6	91	62	67	16
2275	"	1932-33	14	6.8	9.8	0.4	16.2	16	192	5.62	14.98	14.0	84.0	5.6	1,179	13.9	177.2	..	2403	14.2	12.2	13.3	6.0	7.5	9.8	4	0.8	14.6	88	68	70	13
2659	"	1933-34	14	9.4	9.2	0.4	18.0	36	198	5.37	14.98	13.9	100.6	4.4	1,308	14.0	138.4	..	2568	14.2	14.4	10.8	2.2	8.0	8.4	3	0.8	14.8	90	67	70	10
3115	"	1934-35	14	8.0	8.2	0.2	15.8	14	194	5.10	14.98	14.0	89.6	6.4	1,357	13.9	176.8	..	2458	14.8	12.8	11.0	1.5	7.8	7.6	4	1.2	14.6	79	67	72	

TABLE 22 (contd).—SUMMARY OF SPINNING TEST RESULTS FOR STANDARD INDIAN COTTONS, 1924-37.

(b) PUNJAB COTTONS.

1 Sample No.	2 Cotton.	3 Season.	4 Counts Nominal.	5-8 WASTE PERCENTAGES.				9-12 RING FRAME PARTICULARS*				13-26 YARN TEST RESULTS.											27 TEMPERATURE (°F.)	28-29 RELATIVE HUMIDITY (%)		30 Highest Standard Warp Counts.						
				5 Blow Room Loss.	6 Card Room Loss.	7 Spinning Loss.	8 Total Loss.	9 Yarn Breakages per 100 spindles per hour.	10 Front Roller Speed R. P. M.	11 Draft.	12 Turns per inch.	13-16 LEA.				17-19 BALLISTIC.			20-26 SINGLE THREAD.						31 Spinning Room.		32 Testing Room.					
												13 Counts Actual.	14 Strength (lbs.)	15 Strength Irregularity (%)	16 Count-Strength Product.	17 Counts Actual.	18 Work of Rupture (inches-lbs.)	19 Work Irregularity (%)	20 Count-work Product.	21 Counts.	22 Strength (ozs.)	23 Strength Irregularity (%)		24 Weakness Percentage.				25 Extension (%)	26 Extension Irregularity (%)	27 Evenness Class.	28 Ncps per yard.	29 Turns per inch Actual.
				31 Spinning Room.	32 Testing Room.																											
448	P. A. 4F	1924-28	20	7.6	8.0	0.5	15.4	18	185	5.10	16.85	19.5	89.6	6.9	1,838	..	..	..	..	19.8	9.8	12.5	5.0	6.5	12.6	4	2.0	16.3	83	68	66	22
659	..	1929-30	20	9.5	11.7	0.5	20.5	50	189	5.53	16.85	10.0	53.6	10.5	1,050	19.8	100.7	4.4	2192	20.2	8.9	13.6	6.7	7.4	8.4	5	3.3	16.2	83	62	61	20
995	..	1930-31	20	7.3	9.6	0.5	15.9	24	194	5.26	17.98	19.9	72.0	6.5	1,433	20.0	123.8	3.0	2470	20.3	9.7	15.2	9.0	6.6	8.3	3	1.1	17.1	80	72	67	22
1243	..	1931-32	20	7.7	9.9	0.6	17.4	70	193	5.16	17.98	20.0	67.0	6.0	1,352	19.8	141.6	4.2	2804	20.5	10.2	11.9	6.8	8.9	7.8	3	0.8	17.2	83	66	73	20
1679	..	1932-33	20	8.6	9.4	0.7	17.8	70	195	5.16	17.98	19.6	80.8	4.8	1,584	19.2	156.0	4.8	2995	19.6	11.8	13.5	5.8	8.8	8.7	4	1.1	17.4	81	65	72	25
2140	..	1933-34	20	7.6	9.8	0.5	17.0	65	196	5.16	17.98	19.8	80.2	4.6	1,588	20.0	152.2	4.4	3044	20.3	11.8	12.4	5.8	7.8	10.0	4	1.2	17.4	82	70	60	24
2760	..	1934-35	20	7.3	12.8	0.4	17.0	24	198	5.13	17.98	19.7	89.3	4.4	1,740	19.8	162.2	4.0	3212	20.0	12.4	9.5	1.5	7.6	8.2	4	2.1	17.2	88	73	77	27
3074	..	1935-36	20	7.2	10.2	0.4	17.0	42	195	5.20	17.98	20.2	84.2	4.9	1,701	20.1	143.7	4.0	2888	20.8	11.4	10.0	1.8	7.0	7.6	3	1.4	17.4	84	66	68	26
3673	..	1936-37	20	9.3	14.6	0.6	22.8	18	209	5.21	17.98	20.0	89.6	5.4	1,792	20.0	109.0	5.8	3380	20.2	12.4	11.0	2.8	8.2	9.5	4	2.1	17.2	86	80	83	27
440	P. A. 230F	1924-28	20	9.6	10.2	0.4	19.1	12	186	4.64	16.85	19.9	96.1	7.7	1,812	..	..	..	..	19.7	13.4	9.3	2.1	6.5	8.5	2	11.7	16.4	84	67	68	37
660	..	1929-30	20	7.5	11.7	0.2	18.5	8	190	4.76	16.85	19.3	109.2	7.0	2,107	19.5	156.0	3.9	3042	19.7	14.2	9.2	2.0	6.7	8.8	2	5.3	16.3	82	61	67	42
994	..	1930-31	20	8.5	9.8	0.5	17.9	8	197	4.60	16.85	20.1	106.6	3.8	2,143	20.4	147.0	4.2	3011	20.5	13.9	9.4	0.5	6.8	7.4	3	2.5	16.1	82	68	67	44
1239	..	1931-32	20	11.0	13.2	0.6	23.2	10	195	4.60	17.98	20.4	101.2	5.4	2,064	20.2	165.2	4.8	3337	21.1	12.6	10.0	1.8	7.1	8.3	3	8.4	17.2	81	63	65	39
1580	..	1932-33	20	10.1	11.5	0.6	20.9	42	197	4.52	17.98	20.1	114.7	3.7	2,409	20.0	189.7	3.2	3794	20.7	15.4	9.7	1.8	7.4	8.6	3	7.1	17.5	81	68	73	44
2103	..	1933-34	20	9.4	10.8	0.6	19.6	42	198	4.50	16.85	19.9	111.5	3.4	2,219	20.0	185.2	4.0	3734	20.4	15.1	9.2	3.2	7.7	5.9	2	3.0	16.2	81	64	71	45
2625	..	1934-35	20	10.0	12.7	0.5	21.8	16	195	4.49	16.85	20.2	109.2	3.6	2,206	20.4	165.2	4.4	3370	21.2	14.8	10.6	3.0	7.7	7.9	3	5.2	16.3	80	66	68	44
2945	..	1935-36	20	10.0	12.3	0.2	21.2	16	190	4.40	16.85	19.7	117.3	3.9	2,311	19.8	178.8	4.0	3540	20.1	15.3	9.6	1.5	7.4	6.0	3	5.5	16.0	81	69	74	45
3460	..	1936-37	20	9.4	10.7	0.4	19.4	10	194	4.53	16.85	20.6	104.8	5.2	2,159	20.3	161.3	4.0	3274	21.0	13.4	10.1	1.8	7.0	6.4	3	7.0	16.5	80	64	68	44
450	Mollison	1925-29	8	5.4	7.5	0.6	13.0	12	186	5.14	12.07	7.9	96.5	8.1	762	..	..	..	..	7.0	14.0	17.7	12.6	9.7	10.2	5	1.0	11.8	85	64	72	7
643	..	1929-30	8	5.1	9.0	0.3	14.0	6	182	4.41	12.07	7.7	79.0	9.0	698	..	..	..	..	7.9	14.2	16.2	10.0	10.3	9.1	5	1.0	12.0	84	67	68	7
996	..	1930-31	8	7.8	9.2	0.5	16.8	40	195	4.42	12.07	7.8	93.4	7.2	728	7.9	258.4	3.8	2041	8.1	14.6	15.8	11.2	9.7	8.6	5	1.2	11.6	84	68	63	8
1240	..	1931-32	8	6.8	7.7	0.5	14.6	27	200	4.44	12.07	8.2	108.3	6.4	872	8.2	257.0	4.1	2107	8.2	19.0	15.2	9.7	10.2	8.8	3	0.8	11.4	82	69	68	8
1581	..	1932-33	8	10.3	11.8	0.6	21.4	16	196	4.50	12.07	8.0	104.3	6.4	884	8.0	277.6	2.8	2221	8.2	15.6	15.5	11.5	9.8	8.7	4	0.6	11.6	80	63	68	8
2104	..	1933-34	8	7.0	9.0	0.6	16.6	33	204	4.04	12.07	8.1	124.0	5.4	1,094	8.1	313.8	3.4	2542	8.2	18.6	12.1	4.8	11.2	8.4	4	0.6	11.7	82	67	73	10
2626	..	1934-35	8	6.9	11.4	0.5	17.9	33	204	4.48	12.07	8.1	98.8	7.6	890	8.0	298.6	3.4	2389	8.3	15.6	14.0	7.5	11.0	9.3	3	0.4	11.8	82	67	70	8
3092	..	1935-36	8	7.8	12.8	0.4	19.9	82	210	4.60	12.07	8.0	117.0	6.8	930	7.8	326.0	3.2	2543	8.1	18.4	11.1	3.5	10.7	7.8	3	0.4	11.8	80	66	70	9
3423	..	1936-37	8	5.6	10.4	0.2	15.6	22	204	4.65	12.07	8.3	106.6	7.0	885	8.2	335.8	3.0	2754	8.4	16.4	13.4	6.2	10.4	7.8	4	0.8	11.7	81	70	67	8
	..	1936-37	8	6.0	11.8	0.2	17.2	33	202	4.76	12.07	8.3	95.6	7.2	798	8.3	302.6	4.4	2512	8.3	14.7	13.8	6.8	9.8	6.9	3	0.4	11.5	87	73	68	7

* Diameter of ring frame front roller—1". Diameter of rings—1 1/2".

TABLE 22 (contd.)—SUMMARY OF SPINNING TEST RESULTS FOR STANDARD INDIAN COTTONS, 1924-37.

(c) UNITED PROVINCES, CENTRAL PROVINCES AND HYDERABAD COTTONS.

Sample No.	Cotton.	Season.	Counts Nominal.	WASTE PERCENTAGES.				RING FRAME PARTICULARS *				YARN TEST RESULTS.												TEMPERATURE (F.).	RELATIVE HUMIDITY (%)			Highest Standard Warp Counts.
				Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.				SINGLE THREAD.					Spinning Room.	Spinning Room.	Testing Room.	
												Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.						Extension (%)	Extension Irregularity (%)	Evenness Class.	Neps per yard	Turns per inch Actual.
				Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product.	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)	Evenness Class.	Neps per yard	Turns per inch Actual.	Spinning Room.	Spinning Room.	Testing Room.					
482	Aligarh A. 19	1924-28	8	4.1	7.8	0.8	12.4	30	138	4.93	12.07	7.8	88.4	9.8	690	8.1	16.3	15.4	8.7	7.2	12.6	5	0.5	11.8	85	64	65	7
693	"	1924-29	8	3.3	6.7	0.3	10.1	35	180	5.37	12.07	9.0	80.7	9.9	646	8.0	16.2	18.1	12.2	9.6	9.4	6	0.0	11.6	84	62	71	7
948	"	1929-30	8	2.4	7.9	0.3	10.4	55	183	4.95	12.07	7.9	79.3	9.0	626	8.0	15.4	21.4	18.7	9.3	11.8	5	0.1	11.7	85	65	67	7
1240	"	1930-31	8	3.6	9.0	0.6	13.7	53	180	4.76	12.07	8.1	81.5	9.8	684	8.4	15.8	15.1	14.7	8.6	11.3	4	0.0	11.5	81	63	68	7
1657	"	1931-32	8	3.2	10.8	0.4	14.0	191	176	4.81	12.07	8.2	56.5	7.8	463	8.4	11.5	22.2	18.5	7.8	12.4	4	0.9	11.6	87	70	70	7
2145	"	1932-33	8	9.6	12.2	0.6	21.0	174	165	5.54	12.07	8.0	44.8	10.3	358	8.0	13.0	25.8	21.8	9.2	13.6	5	0.6	11.6	82	67	69	6
2710	"	1933-34	8	9.4	13.0	0.4	21.5	202	180	5.58	12.07	8.1	36.2	9.3	293	8.2	10.5	24.6	22.0	8.4	16.9	5	0.9	11.6	85	71	70	6
3017	"	1934-35	8	7.1	10.1	0.4	17.6	33	160	5.46	12.07	8.4	52.2	10.0	438	8.4	12.8	21.0	10.2	8.2	11.7	4	0.9	11.5	82	69	68	6
3484	"	1935-36	8	8.3	10.6	0.4	17.5	33	170	5.39	12.07	8.3	63.3	8.9	525	8.4	13.4	20.7	16.0	8.4	9.6	4	0.2	12.3	80	64	63	6
	"	1936-37	8	9.0	11.2	0.2	19.4	16	176	5.30	12.07	8.2	67.6	10.4	554	8.4	14.7	19.7	16.0	8.0	11.2	4	0.2	11.6	81	70	68	6
1235	C402 (U. P.)	1931-32	16	5.3	8.4	0.6	13.5	36	200	6.07	15.97	15.8	76.2	6.5	1,204	16.6	11.7	11.5	6.0	7.2	12.1	3	1.2	15.5	79	64	70	15
1612	"	1932-33	16	5.4	8.9	0.4	14.2	33	195	6.10	15.97	16.2	74.4	9.2	1,205	16.0	12.7	12.0	3.8	7.4	7.1	4	1.0	15.4	80	69	72	14
2088	"	1933-34	16	7.8	9.9	0.5	17.4	24	191	5.88	15.97	16.1	86.1	6.0	1,386	16.0	12.4	13.4	6.5	6.3	11.4	4	1.0	15.4	79	65	70	14
2643	"	1934-35	16	7.5	11.6	0.4	18.5	9	196	5.55	15.97	16.4	102.5	5.5	1,681	16.6	14.0	11.4	1.8	7.2	7.7	3	1.8	15.3	80	68	68	22
3091	"	1935-36	16	6.9	8.4	0.2	14.9	9	184	6.15	15.97	16.2	77.6	8.2	1,257	16.2	12.7	11.6	3.8	6.6	6.8	4	0.8	15.2	81	67	68	16
3476	"	1936-37	16	6.8	8.2	0.4	14.8	3	190	5.56	15.97	16.2	103.2	3.7	1,672	15.9	14.3	11.0	2.2	6.8	8.5	3	2.0	15.2	80	64	68	23
468	Verum 262 (Nagpur)	1926-28	20	6.0	8.6	0.3	14.2	4	185	5.83	16.85	20.0	67.0	8.3	1,340	20.4	10.6	11.6	2.0	7.1	6.4	4	2.0	16.2	84	70	65	25
628	"	1928-29	20	7.6	10.2	0.3	17.4	10	182	5.28	16.85	19.4	72.0	9.6	1,397	20.4	9.9	14.5	6.5	6.2	8.7	4	3.3	16.2	84	60	72	26
982	"	1929-30	20	4.3	6.3	0.5	10.8	40	190	4.90	16.85	20.0	59.1	8.1	1,182	20.6	10.0	18.8	17.0	7.4	9.3	3	2.8	16.4	81	66	72	21
1242	"	1930-31	20	3.0	7.0	0.3	10.1	7	178	5.34	16.85	20.1	71.8	7.8	1,443	20.1	11.1	12.4	7.5	7.1	8.3	3	1.6	16.2	81	71	70	21
1600	"	1931-32	20	5.0	7.6	0.6	12.6	20	192	5.26	17.98	20.3	80.0	6.9	1,424	20.6	11.2	12.8	5.5	7.2	7.6	3	1.2	17.2	81	67	74	22
2112	"	1932-33	20	4.8	7.2	0.4	12.1	39	193	5.16	17.98	20.2	76.6	7.0	1,547	20.8	11.6	11.4	3.9	7.2	8.8	3	1.4	17.2	78	70	74	23
2556	"	1933-34	20	4.4	7.4	0.4	11.9	68	196	5.18	17.98	19.7	80.0	5.9	1,576	19.6	11.9	11.0	3.0	7.2	9.2	4	1.2	17.4	79	61	72	24
3002	"	1934-35	20	3.6	7.6	0.4	11.2	18	198	5.00	17.98	19.6	98.2	3.8	1,925	20.0	14.4	9.4	3.0	6.0	9.2	4	1.4	17.4	81	65	72	24
3455	"	1935-36	20	2.7	9.6	0.3	12.3	38	188	4.80	17.98	20.2	75.5	7.0	1,525	20.1	11.2	12.8	2.5	6.3	6.0	3	1.8	17.2	81	65	65	24
	"	1936-37	20	3.2	7.0	0.4	10.4	26	201	4.49	17.98	19.5	82.5	6.8	1,600	20.0	11.3	12.4	6.3	6.9	7.0	3	0.6	17.4	79	63	70	25
1241	Late Verum (Nagpur)	1930-31	20	3.0	7.1	0.4	10.2	15	198	5.26	17.98	20.0	89.2	5.5	1,784	20.6	11.4	11.3	3.5	7.0	7.6	3	2.7	17.2	84	68	62	30
1640	"	1931-32	20	2.7	7.4	0.4	10.2	0	193	6.10	17.98	20.0	87.9	4.7	1,758	20.5	11.3	9.8	2.0	6.9	8.0	3	1.7	17.1	81	70	67	29
2204	"	1932-33	20	5.2	6.9	0.4	12.0	21	197	6.05	17.98	19.6	87.8	3.6	1,721	20.5	10.9	13.7	7.0	7.8	8.4	3	1.5	17.2	81	65	74	31
2557	"	1933-34	20	2.3	7.9	0.4	10.4	5	199	6.10	17.98	19.9	88.5	3.7	1,781	20.2	14.4	14.4	8.0	6.2	9.4	3	1.2	17.1	80	68	70	34
3003	"	1934-35	20	4.2	7.0	0.4	11.2	10	200	5.00	17.98	20.4	100.8	5.7	2,056	20.3	10.1	8.6	0.8	6.8	8.2	3	0.0	17.3	82	65	73	36
3456	"	1935-36	20	2.8	9.0	0.2	11.3	5	188	4.79	17.98	20.4	88.4	5.2	1,808	20.3	12.2	12.0	2.5	7.6	7.0	3	1.8	17.9	84	69	65	33
	"	1936-37	20	2.6	6.8	0.4	9.6	2	200	4.78	17.98	20.2	90.7	6.2	1,832	20.0	11.6	11.2	2.5	6.9	8.1	3	1.6	17.2	80	65	68	31
320	Verum 262 (Akola)	1927-28	20	6.5	6.5	0.2	12.8	10	180	5.32	16.85	19.2	57.5	7.8	1,104	19.7	9.3	13.6	6.0	6.3	6.8	3	1.2	16.3	81	64	61	19
435	"	1928-29	20	4.4	7.3	0.3	11.7	40	195	4.70	16.85	20.0	60.7	8.5	1,214	20.4	10.0	13.2	6.5	6.6	7.4	3	3.3	16.4	83	69	71	24
618	"	1929-30	20	6.4	6.6	0.2	12.7	25	190	5.13	16.85	19.7	60.2	8.1	1,186	20.0	9.0	13.4	5.5	6.5	10.1	3	1.1	16.2	85	68	64	21
908	"	1930-31	20	4.4	7.7	0.6	12.4	77	185	5.20	16.85	19.5	55.4	9.2	1,080	19.7	8.9	15.2	8.7	6.7	7.7	3	2.6	16.0	83	64	66	18
1241	"	1931-32	20	4.4	8.2	0.4	12.6	62	191	5.21	17.98	20.1	69.0	6.4	1,387	20.4	121.0	9.8	8.2	7.0	9.0	3	1.9	17.3	81	65	66	21
1504	"	1932-33	20	4.9	7.7	0.4	12.6	29	195	5.00	17.98	19.5	90.6	4.8	1,767	19.3	12.7	11.6	2.2	7.7	7.0	3	1.5	17.4	81	69	74	25
2094	"	1933-34	20	5.2	7.7	0.4	13.0	60	196	5.12	17.98	19.4	77.3	6.9	1,501	19.6	12.8	12.8	5.5	6.4	11.2	4	1.3	17.3	81	65	74	21
2559	"	1934-35	20	5.6	8.1	0.4	13.6	44	200	5.00	17.98	19.6	76.6	5.7	1,501	19.9	12.9	9.3	2.8	7.4	8.7	4	2.1	17.4	81	64	72	22
2938	"	1935-36	20	5.9	8.2	0.2	13.9	5	188	4.61	17.98	19.7	71.2	7.9	1,403	19.8	13.7	14.2	7.5	6.9	6.3	3	0.8	17.2	81	66	71	20
3417	"	1936-																										

TABLE 22 (contd.)—SUMMARY OF SPINNING TEST RESULTS FOR STANDARD INDIAN COTTONS, 1923-37.

(d) MADRAS COTTONS.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33																									
																																	WASTE PERCENTAGES.				RING FRAME PARTICULARS.*				YARN TEST RESULTS.												TEMPERATURE (°F.)	RELATIVE HUMIDITY (%)		HIGHEST STANDARD WARP COUNTS.	
																																	Blow Room Loss.	Card Room Loss.	Spinning Loss.	Total Loss.	Yarn Breakages per 100 spindles per hour.	Front Roller Speed R. P. M.	Draft.	Turns per inch.	LEA.				BALLISTIC.			SINGLE THREAD.						Spinning Room.	Spinning Room.		Testing Room.
																																									Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.					
Sample No.	Cotton.	Season.	Counts Nominal.	Counts Actual.	Strength (lbs.)	Strength Irregularity (%)	Count-Strength Product	Counts Actual.	Work of Rupture (inch-lbs.)	Work Irregularity (%)	Count-work Product.	Counts.	Strength (ozs.)	Strength Irregularity (%)	Weakness Percentage.	Extension (%)	Extension Irregularity (%)	Evenness Class.	Keps per yard.	Turns per inch Actual.	Spinning Room.	Spinning Room.	Testing Room.	Highest Standard Warp Counts.																																	
595	Co. 2 (440)	1924-26	20	2.2	9.5	0.0	12.4	21	187	4.31	16.85	16.6	85.8	5.0	1,682	..	..	..	20.0	11.7	0.1	1.4	0.1	0.3	2	6.3	16.2	88	70	60	31																							
706		1924-29	20	4.4	9.5	0.4	14.1	10	191	4.44	16.85	19.4	75.3	4.6	1,461	19.8	110.5	3.3	2,188	20.3	9.2	0.2	0.8	0.5	2	6.3	16.1	90	66	71	25																										
1057		1929-30	20	5.0	9.5	0.2	10.1	0	185	5.00	16.85	20.0	78.6	4.6	1,578	20.1	122.6	3.3	2,464	20.7	10.6	0.3	0.8	0.5	3	4.0	16.2	88	66	65	24																										
1350		1930-31	20	5.0	9.0	0.3	14.5	3	200	4.67	16.85	19.9	77.8	3.0	1,648	20.1	121.2	3.3	2,436	20.5	10.0	0.7	7.8	7.3	3	4.8	16.1	92	63	67	29																										
1764		1931-32	20	5.0	10.0	0.6	15.8	26	198	4.86	16.85	20.0	73.8	4.5	1,470	20.4	115.6	3.3	2,358	20.2	10.0	0.2	7.8	7.0	3	3.8	16.4	91	68	67	27																										
2245		1932-33	20	3.4	10.0	0.0	16.2	13	200	4.45	16.85	20.0	71.0	3.4	1,420	20.1	117.1	3.2	2,354	20.2	9.8	0.2	7.8	6.2	4	4.2	16.1	89	68	67	24																										
2564		1933-34	20	4.4	9.4	0.4	13.8	16	202	4.34	16.85	19.8	74.4	4.3	1,473	19.8	117.0	3.0	2,317	20.3	9.8	0.1	1.7	0.8	4	4.5	16.0	88	67	64	26																										
2764		1934-35	20	6.2	11.4	0.3	17.2	0	192	4.65	16.85	19.5	92.4	4.0	1,802	19.6	158.2	5.2	3,101	19.6	12.6	0	8.2	0.8	3	3.9	16.0	87	70	67	30																										
3129		1935-36	20	4.4	7.6	0.3	11.8	5	202	4.66	16.85	19.8	87.5	3.0	1,732	20.2	130.6	3.4	2,638	20.5	11.1	10.2	1.0	7.0	9.5	3	1.5	16.2	89	65	72	30																									
3634		1936-37	20	6.6	9.6	0.3	15.8	8	204	4.38	16.85	19.8	87.4	3.8	1,730	19.6	141.7	3.6	2,777	19.9	11.8	7.9	0.5	7.9	6.6	3	1.2	16.0	90	66	68	33																									
506	Nandyal 14	1923-26	20	7.7	8.4	0.7	16.0	20	184	4.40	16.85	19.6	87.6	7.7	1,717	..	..	..	20.2	11.9	10.6	3.6	5.6	0.9	3	4.5	16.2	80	70	67	33																							
720		1924-29	20	4.8	8.0	0.3	12.7	17	192	4.35	16.85	20.2	79.7	7.4	1,610	20.5	142.8	3.5	2,917	20.9	11.5	13.6	6.0	6.9	7.2	3	4.1	16.2	91	66	69	31																									
1044		1929-30	20	2.6	7.0	0.6	10.0	40	202	4.72	16.85	20.0	90.1	5.9	1,802	20.2	140.4	3.4	2,836	20.2	12.7	12.9	3.7	6.6	8.3	2	2.0	16.2	92	63	63	35																									
1334		1930-31	20	5.3	7.6	0.4	12.9	11	197	4.44	16.85	19.8	91.7	5.8	1,810	20.2	145.4	3.4	2,937	20.2	11.8	12.0	3.7	6.3	8.2	3	4.1	16.2	91	66	69	35																									
1498		1931-32	20	4.7	7.4	0.6	12.3	29	200	4.45	16.85	20.0	78.0	7.8	1,560	20.6	130.0	3.6	2,600	20.6	10.6	14.6	5.7	6.2	8.3	3	1.8	16.2	93	66	64	30																									
2246		1932-33	20	4.8	9.0	0.4	13.6	34	200	4.34	16.85	19.4	109.2	5.8	2,118	19.4	176.5	4.4	3,424	19.6	14.4	9.4	2.2	7.4	6.9	2	2.1	16.1	88	70	78	37																									
2567		1933-34	20	4.0	7.8	0.4	11.6	32	201	4.20	16.85	19.9	99.8	6.8	1,886	20.2	163.8	4.0	3,299	20.0	14.6	9.5	1.0	7.4	6.7	2	1.6	16.4	87	68	70	37																									
3175		1934-35	20	3.5	9.8	0.4	13.3	26	194	4.30	16.85	20.2	103.8	6.0	2,097	20.2	166.5	5.1	3,363	20.4	14.0	11.2	2.5	7.4	7.5	3	2.5	16.1	87	74	74	40																									
3658		1935-36	20	4.5	5.6	0.2	10.1	2	184	4.64	16.85	19.7	108.2	4.7	2,092	19.9	175.4	5.1	3,490	19.8	14.4	9.4	1.0	7.5	6.7	3	2.1	16.2	90	69	72	40																									
3658		1936-37	20	5.4	6.8	0.4	12.2	5	204	4.61	16.85	19.8	115.0	4.8	2,277	19.6	191.4	3.8	3,751	20.6	13.5	9.6	1.5	6.8	6.4	3	3.0	16.2	90	69	75	42																									
507	Hagari 1	1924-27	20	3.8	9.7	0.5	13.5	11	185	4.39	16.85	19.3	84.6	5.0	1,631	..	..	..	19.3	11.8	9.7	1.8	6.1	9.4	2	2.2	16.3	88	75	71	29																							
736		1924-29	20	3.9	6.9	0.2	10.8	35	191	4.44	16.85	19.6	66.7	4.9	1,397	20.9	110.4	3.7	2,208	20.1	10.1	13.2	6.0	7.0	7.8	2	0.8	16.3	92	69	68	24																									
1031		1929-30	20	3.2	6.8	0.4	10.1	42	200	4.30	16.85	19.4	81.0	7.0	1,571	19.7	130.2	3.2	2,565	20.1	11.8	9.8	0.7	8.0	7.8	3	2.8	16.2	91	62	65	27																									
1311		1930-31	20	1.6	5.0	0.4	6.9	3	198	4.55	16.85	19.9	94.1	4.6	1,873	20.3	137.6	4.2	2,793	20.9	11.8	9.8	1.5	6.7	7.1	3	0.7	16.1	91	64	66	36																									
1750		1931-32	20	2.0	5.9	0.8	8.6	26	198	4.32	16.85	19.8	80.0	5.7	1,544	19.6	132.9	2.9	2,695	20.1	11.2	9.6	2.0	7.0	8.4	3	0.6	16.2	87	66	68	30																									
2248		1932-33	20	3.9	6.6	0.6	10.8	73	199	4.26	16.85	19.9	68.9	6.8	1,371	20.1	117.0	3.0	2,352	19.8	10.2	14.4	6.8	6.6	10.4	3	0.6	16.2	89	67	69	25																									
2568		1933-34	20	2.8	7.8	0.4	10.3	26	200	4.50	16.85	19.6	76.6	5.0	1,501	19.4	129.6	3.6	2,514	19.4	11.4	12.0	3.5	6.0	9.2	3	0.9	16.0	87	68	69	28																									
2765		1934-35	20	3.7	8.2	0.4	11.9	29	194	4.52	16.85	20.0	78.6	5.3	1,572	19.9	130.5	3.5	2,597	20.6	11.0	12.1	4.5	7.2	8.4	3	0.8	15.8	84	74	73	29																									
3154		1935-36	20	3.2	5.4	0.2	8.6	16	185	4.40	16.85	19.8	81.0	5.4	1,604	19.9	122.5	2.8	2,438	20.2	11.4	10.8	3.8	5.8	11.8	3	0.5	16.2	88	66	70	30																									
3643		1936-37	20	3.8	6.2	0.4	10.1	13	206	4.36	16.85	19.8	79.5	6.8	1,574	19.6	128.8	3.1	2,524	20.1	10.4	11.7	3.8	5.9	10.6	3	0	16.0	90	67	72	30																									
510	Karunganni C. 7	1924-26	20	4.5	8.2	0.6	12.8	21	189	4.32	16.85	19.9	72.2	7.5	1,437	..	..	..	20.1	10.2	13.3	5.6	5.7	8.6	3	2.8	16.2	88	70	65	25																							
717		1924-29	20	4.4	8.2	0.6	12.8	57	188	4.37	16.85	19.4	56.7	5.7	1,090	19.6	107.6	4.3	2,109	19.6	9.7	11.8	5.5	6.0	10.0	4	4.2	16.2	91	65	70	29																									
1045		1929-30	20	3.8	8.5	0.6	12.0	95	186	4.60	16.85	19.3	67.2	8.1	1,267	19.8	118.8	3.9	2,352	20.5	9.6	16.4	9.5	5.6	11.4	3	3.7	16.1	92	61	62	23																									
1320		1930-31	20	4.9	8.8	0.4	13.6	37	190	4.60	16.85	19.7	71.5	6.0	1,409	19.8	121.5	2.8	2,406	19.6	11.2	12.8	6.0	7.0	8.0	3	3.6	16.3	91	70	70	26																									
1777		1931-32	20	3.8	7.3	0.4	11.2	39	186	4.50	16.85	19.6	61.0	8.8	1,196	19.6	128.9	3.6	2,526	20.1	9.4	14.8	7.5	6.2	8.0	3	1.6	16.3	89	68	66	21																									
2276		1932-33	20	5.6	9.2	0.4	14.7	57	190	4.51	16.85	19.2	70.8	6.2	1,359	19.0	133.1	3.7	2,559	19.4	11.0	13.0	4.5	7.2	7.4	2	2.2	16.2	90	65	71	23																									
2765		1933-34	20	4.1	8.5	0.6	12.7	47	188	4.40	16.85	19.2	79.7	6.3	1,																																										

