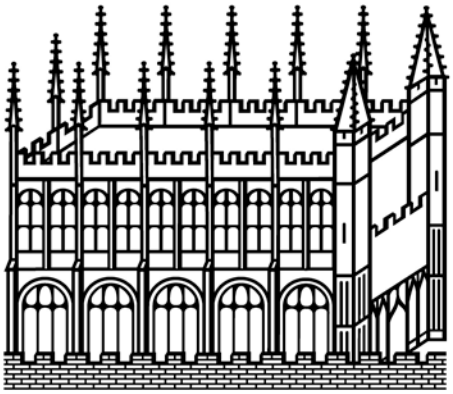


REPORT

ON THE

COTTON DEPARTMENT

FOR THE YEAR 1868-69.

BY

HARRY RIVETT-CARNAC, ESQ., B.C.S.,

COTTON COMMISSIONER FOR THE CENTRAL PROVINCES AND THE BERARS.

Bombay:

PRINTED AT THE

EDUCATION SOCIETY'S PRESS, BYCULLA.

1869.

I.

Sketch Map showing the Districts, Cotton Markets, Chief Products, Waste Lands, &c. in the CENTRAL PROVINCES and the BERARS.

I.

Sketch Map showing the Distr
Cotton Markets, Chief Produ
Waste Lands, &c. in th
CENTRAL PROVINCES
and the BERARS.

REPORT

ON THE

COTTON DEPARTMENT

FOR THE YEAR 1868-69.

BY

HARRY RIVETT-CARNAC, ESQ., B.C.S.,

COTTON COMMISSIONER FOR THE CENTRAL PROVINCES AND THE BERARS.

Bombay:
PRINTED AT THE
EDUCATION SOCIETY'S PRESS, BYCULLA.

1869.

INDEX.

SECTION III.—EXPORTS OF COTTON.

I.—Exports from the Central Provinces.

II.—Exports from the Berars.

SECTION IV.—MEASURES ADOPTED TO IMPROVE THE CULTIVATION OF COTTON.

I.—By the selection of Indigenous Seed.

II.—By the introduction of Exotic Seed.

III.—General measures for the improvement of the Cultivation.

IV.—Seed supplied to various Quarters.

SECTION V.—MEASURES ADOPTED FOR THE ASSISTANCE OF THE TRADE.

SECTION VI.—SLIGHT SKETCH OF THE PRESENT POSITION OF THE COTTON TRADE.

POSTSCRIPT.

LIST OF MAPS.

NOTE.

THE Supplement to this Report, containing the figures of the area under Cotton Cultivation in the Central Provinces and the Berars for the season 1869-70, together with the latest information regarding the prospects of the crop, will be published in the course of a week or ten days, on the conclusion of a tour through the chief Cotton-growing tracts.

H. RIVETT-CARNAC.

Camp, Sheagaon, 17th November 1869.

No. 2578 of 1869.

From H. RIVETT-CARNAC, Esq.,
Cotton Commissioner for the Central Provinces and the Berars,

To The FIRST ASSISTANT RESIDENT,
Hyderabad.

Dated Nagpore, 12th August 1869.

Sir,

I have the honour to submit the Annual Report of this Department for the year 1868-69.

2. The Report, dated the 30th of June 1868,* contained such information as I had been able to collect during the season which had then just closed, and it was therein explained that the Report of the Cotton Commissioner, if it is to contain statistics of interest and use to the public and to the trade, cannot well be prepared until the cotton crop has been cleared out of these Provinces, until the trade and agricultural statistics (which are not due until August) have been received, and until the commencement of the monsoon grants the Cotton Commissioner a respite from the more active duties of his office. This year, the cotton season, which commenced early, was unusually prolonged into the hot months; and the late arrival of the rains, the arrangements

Introductory.

* I would desire to be permitted to take this opportunity of noting that the delay in the publication of the Report for 1867-68 was owing to circumstances which will be provided against on this and future occasions. The Resident, as you are aware, very kindly gave me permission to correct the proofs, which I was not unnaturally anxious to revise, and this process was rendered difficult by my constant absence from head-quarters.

for the new seed gardens, and urgent business connected with the branch line of Railway to Khangaon, have all combined to keep me absent from head-quarters, and have obliged me to defer the preparation of this Report. Last month, however, at the desire of the Chamber of Commerce, the details of the exports from these Provinces during the season 1868-69, and a review of the trade during that period, were prepared for that body, and copies of this letter, which was indeed a brief report of the year's operations, were submitted to Government. The present Report, moreover, contains the latest information up to date, and up to the end of the cotton season, which has only recently closed in Bombay; and it is hoped, therefore, that no inconvenience may arise from its preparation having been, from unavoidable causes, somewhat postponed.

Arrangement of the Report.

3. In my last Report the importance of considering the area under cotton cultivation and the trade and exports from these Provinces in connection with the state of the weather during the season was explained; and it will, therefore, perhaps, be convenient to follow the order therein observed, and to refer first to the acreage sown with cotton in 1868-69, as compared with the figures of former years.

SECTION I.

AREA UNDER COTTON CULTIVATION.

I.—In the Central Provinces.

4. In the following Statement **A** the statistics for each District of the Central Provinces for the past two seasons are given in detail. The totals show that whereas in 1867-68 735,633 acres were sown with cotton, the area in 1868-69 rose to 750,875 acres, an increase of 15,242 acres. These figures will be found to differ from the return given in my last Report framed on an estimate prepared early in the season, which was corrected in the Secretary's Office later in the year on the receipt of the revised statistics from the Districts. Moreover, it will be remembered that the cotton crop of 1867-68 was a particularly poor one; that the deluge of rain which swept over our Districts, in many instances rotted the plants, so that the cultivators, ploughing up the damaged cotton, prepared their fields for a spring crop. And for this reason, the estimate of the area sown with cotton was, in the case of several Districts, reduced by me, as the figures, although they might show the quantity of land actually sown with cotton, did not represent the area from which the crop was reaped. This season, although the drought has been as remarkable as was the preceding year's downpour, the chief cotton-growing tracts, as will be explained in a later paragraph, did not suffer, and thus it has not been found necessary to make any such deductions. In this season's returns also the acreage sown with cotton in the Feudatory States has been included, as the figures appear to be entitled to a place in this Report. For facility of reference, the statistics from the year 1861-62 up to date are abstracted below:—

Area under cotton cultivation in the Central Provinces.

Area under Cotton Cultivation in the Central Provinces.

1861-62....375,623	1865-66....587,398	
1862-63....427,111	1866-67....598,801	
1863-64....488,436	1867-68....735,633	Includes about 100,000
1864-65....691,198	1868-69....750,875	of Zemindary.

The average of the last eight years being 581,884 acres, the figures for this season—750,875—stand thus considerably above the average, even when the large area of the cultivation in the Feudatory States now brought into the return is deducted.

A.

STATEMENT showing the Area under Cotton Cultivation in the Central Provinces during the year 1868-69, *as compared with* 1867-68.

Divisions.	Districts.	Acres 1867-68.	Acres 1868-69.	Increase.	Decrease.	
NAGPORE	Nagpore	77,024	86,081	9,057	....	
	Bhundara	35	....	....	35	
	Chanda	40,477	39,169	....	1,308	
	Wurdah.....	159,675	173,514	13,839	..	
	Total..	277,211	298,764	22,896	1,343	
JUBBULPORE ..	Jubbulpore	29,482	28,180	....	1,302	
	Saugor	30,907	24,389	....	6,518	
	Dumoh	16,200	14,200	....	2,000	
	Seonee	5,451	5,317	....	134	
	Mundla	1,362	1,685	323	..	
	Total..	83,402	73,771	323	9,954	
NERBUDDA	Baitool	1,357	537	....	820	
	Chindwarra	41,632	37,053	....	4,579	
	Hoshungabad	14,688	16,708	2,020	....	
	Nursingpore.....	75,450	61,828	....	13,622	
	Nimar	30,321	25,625	....	4,696	
	Total..	163,448	141,751	2,020	23,717	
CHUTTEESGURH	Raepore	70,238	83,436	13,198	....	
	Sumbulpore	90,000	79,540	....	10,460	
	Belaspore	50,453	72,922	22,469	....	
	Total..	210,691	235,898	35,667	10,460	
	Upper Godavery	881	691	....	190	
	Total..	735,633	750,875	60,906	45,664	Total increase 15,242.

H. RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12*th August* 1869.

5. An examination of Statement **A** in detail suggests the following remarks. The cultivation in the Wurdah Valley and the country south of the Sautpooras, has, thanks to a favourable season and high prices, recovered itself, and the area sown with cotton has increased. In the Northern Division, where the soil is not so well adapted to cotton cultivation, the severe drought of last season appears to have told on the cotton; and in the Jubbulpore, Saugor, and Dumoh Districts a falling off in the cultivation is apparent. In the Chutteesgurh country considerable fluctuations are noticeable in the returns. But then it is to be remembered that the Land Revenue Settlement is only now providing for these remote Districts the statistics which have for some time since been available for the other Divisions of these Provinces.

Fluctuations in the cultivation.

6. The area sown with cotton in the Feudatory States is a rough estimate altogether, as the settlement has not, of course, been extended to those tracts. On the whole, although the returns for this extensive, and in many parts wild, tract of country cannot pretend to perfect accuracy, they will nevertheless, I believe, convey a sufficiently correct idea of the area under cotton cultivation in the Central Provinces. The figures are prepared by the village accountants, who early in the season go through the districts, and, with the aid of the village papers, note the fields, and the area of the fields, sown with cotton, and send in the totals to the District head-quarters, where they are examined and corrected. Some margin must, of course, be left for errors, and efforts are now being made to reduce this margin as much as possible; but the estimate—and it does not pretend to be much more—is, I believe, fair enough.

Manner of the preparation of the statistics.

II.—Area under Cotton Cultivation in the Berars.

7. The following Statement **B** shows the area under cotton cultivation during the past season in the Berars. The re-arrangement of the administrative circles, by which the Akola and Mekhur Districts have been transformed into the Akola, Booldana, and Bassim Districts, whilst Oomraotee and Woon have both given and taken so as to erect their territory into the three compact districts of Oomraotee, Woon, and Ellichpore, has rather complicated the returns.

8. But the totals give the following unmistakeable results. The area under cotton cultivation has increased from 1,254,552 acres in 1867-68 to 1,286,742 acres,—the figures of the present season,—or an increase of 32,190 acres in the year under report. The Land Revenue

B.

STATEMENT showing the Area under Cotton Cultivation in the Berars during 1868-69, *as compared with* 1867-68.

Divisions.	Districts.	Acres 1867-68.	Acres 1868-69.	Increase.	Decrease.	
East Berar	Oomraotee	418,353	182,183	....	....	
	Ellichpoor	....	309,172	....	....	
	Woon	175,800	131,161	....	....	
West Berar....	Akola	550,571	406,862	. ..	....	
	Booldana.....	....	195,123	....	....	
	Bassim	109,828	62,241	....	. ..	
		1,254,552	1,286,742	32,190	....	Total increase 32,190.

H. RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12*th August* 1869.

Settlement, on the operations of which we chiefly depend for our maps and statistics, has not yet been completed in the Berars; but for all practical purposes the above figures are accurate enough, and there can be little doubt that 1,286,742, or rather more than 1¼ millions of acres, represent with sufficient correctness the area under cotton cultivation during the season under report. The figures for the former years are given in the margin,* and this year's returns would seem to show that high prices, and the satisfactory condition of the trade, have resulted in an increase of the cultivation, which would hardly appear to admit of much further extension. For in the valley of the Poornah, cotton now takes up nearly 40 per cent. of the cultivated area, which, allowing for the rotation of crops, and for the garden lands which an enriched peasantry require, does not leave much margin. Taking the total cultivated area of the Berars at 4,703,618 acres, the figures of Mr. Lyall's Census Report, cotton takes up about 28 per-cent. of the land annually sown in the Berars.

Cotton cultivation in the Berars.

*	Acres.
1864-65	1,196,300
1865-66	910,000
1866-67	1,238,966
1867-68	1,254,552
1868-69	1,286,742

9. In the following Statement C the cotton area of the Central Provinces is shown side by side with that of the Berars. The increase in the former Province is 15,242 acres, in the latter 32,190 acres, making a total increase of 47,432 acres during the year under report,—figures which are well supported by the large exports of the past season. Taking the figures of the two Provinces together, it may be said, speaking roughly, that the Central Provinces, including the Feudatory States, has ¾ of a million of acres under cotton cultivation. The much smaller territory of the Berars has about 1¼ millions of acres sown with cotton, making a total of rather over 2 millions of acres devoted to this crop in the Central Provinces and the Berars.

10. During the past year great efforts have been made in the Central Provinces to render the agricultural statistics as accurate as possible. The figures have been carefully examined and revised, whilst the completion of the Land Revenue Settlement in some Districts has supplied details which until recently were not available. The census taken in the Berars, and Mr. Lyall's Report thereon, enable me to supply figures for that Province also, which will be found much fuller than those given by me last year,

Statistics of the Agricultural resources of the Central Provinces and the Berars.

C.

STATEMENT showing the Area under Cotton Cultivation in the Central Provinces and the Berars during the year 1868-69, *as compared with* 1867-68.

Divisions.	Districts.	Acres 1867-68.	Acres 1868-69.	Increase.	Decrease.	
NAGPORE.	Nagpore	77,024	86,081	9,057	....	
	Bhundara	35	....	....	35	
	Chanda	40,477	39,169	....	1,308	
	Wurdah	159,675	173,514	13,839	....	
	Total....	277,211	298,764	22,896	1,343	
JUBBULPORE.	Jubbulpore	29,482	28,180	....	1,302	
	Saugor	30,907	24,389	....	6,518	
	Dumoh	16,200	14,200	....	2,000	
	Seonee	5,451	5,317	....	134	
	Mundla	1,362	1,685	323	....	
	Total....	83,402	73,771	323	9,954	
NERBUDDA.	Baitool	1,357	537	....	820	
	Chindwarra	41,632	37,053	....	4,579	
	Hoshungabad	14,688	16,708	2,020	....	
	Nursingpore	75,450	61,828	....	13,622	
	Nimar	30,321	25,625	....	4,696	
	Total....	163,448	141,751	2,020	23,717	
CHUTTEESGURH.	Raepore	70,238	83,436	13,198	....	
	Sumbulpore	90,000	79,540	....	10,460	
	Belaspore	50,453	72,922	22,469	....	
	Total....	210,691	235,898	35,667	10,460	
	Upper Godavery	881	691	....	190	
	Total....	735,633	750,875	60,906	45,664	Total increase 15,242.
	The Berars.					
EAST BERAR	Oomraotee	418,353	182,183	....	....	
	Ellichpore	....	309,172	....	....	
	Woon	175,800	131,161	....	....	
WEST BERAR	Akola	550,571	406,862	....	....	
	Booldana	....	195,123	....	....	
	Bassim	109,828	62,241	....	....	
	Total....	1,254,552	1,286,742	32,190	....	Total increase 32,190.
	Central Provinces	735,633	750,875	60,906	45,664	
	Berars	1,254,552	1,286,742	32,190	....	
	Grand Total Central Provinces and Berars	1,990,185	2,037,617	93,096	45,664	
	Increase in Central Provinces	....	....	15,242		
	Increase in the Berars	....	....	32,190		
	Total increase in the Central Provinces and Berars	....	....	47,432		

H. RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12*th August* 1869.

and for which, in some instances, I was dependent on reports written before the Berars had enjoyed the benefits of a series of rich cotton harvests. Statements **D** and **E**, containing the most recent figures, have, therefore, been added, and I am sanguine they will be found to embody statistics indicative of the agricultural resources of these Provinces, which cannot fail to be of interest to those who desire to study the position and prospects of the Central Provinces and the Berars as a cotton-growing country.

11. I have abstracted below the figures taken from the last Administration Report of Mr. Morris, the Chief Commissioner, showing the proportions in which the various grains and other crops are grown in these Provinces; and it is perhaps hardly necessary for me to apologize for introducing into this Cotton Report this very interesting information. The figures include every district of the Central Provinces, with the exception of Sumbulpore, in which the Land Revenue Settlement is still incomplete:—

Percentages of the various crops in the Central Provinces.

	Acres.
Rice	2,899,230
Wheat	3,125,493
Other food grains	4,694,809
Oil-seeds	745,237
Sugar-cane	95,668
Cotton	671,336
Opium	8,682
Fibres	18,019
Tobacco	19,857
Vegetables	58,634
Miscellaneous	14,847
Total Acres	12,351,812

12. Of the total 12,351,812 acres cultivated in the sixteen districts, 671,336 acres, or 5·5 per cent. only, is taken up by cotton; wheat, rice other food grains of sorts, especially jowaree (Holcus sorghum), and even oil-seeds, beat it, there being 4·3 acres of rice, 4·7 acres of wheat, and 7 acres of jowaree and other food grains sown to one of cotton; whereas the acreage cultivated with oil-seeds exceeds the cotton area by 73,901 acres.

D.

STATEMENT showing the Agricultural

Divisions.	Districts.	Area in square miles.	Area in Acres. Cultivated.	Arable Uncultivated.	Forest or Waste.	Total.	Proportion of cultivated to arable uncultivated land. 100 to	Percentage of cultivation on area.	Total Land Revenue.	Average per acre. a.	p.
Nagpore.	1. Nagpore	3,734	946,250	413,228	587,429	1,946,907	43	48·59	799,643	13	6
	2. Bhundara	3,922	819,922	581,767	613,425	2,015,114	79	46·40	408,755	7	10
	3. Chanda	10,000	606,324	2,503,816	1,103,669	4,213,809	413	14·39	230,945	6	6
	4. Wurdah	2,379	753,157	300,093	230,326	1,283,576	39	58·68	484,827	10	6
	5. Balaghat.....	2,608	214,587	605,448	115,696	935,731	282	22·93	69,526	5	2
	Total....	22,643	3,340,240	4,404,352	2,650,545	10,395,137	132	32·13	1,993,696	9	6
Jubbulpore.	6. Jubbulpore....	4,261	884,740	532,040	513,766	1,930,546	60	45·83	559,656	10	1
	7. Saugor	4,005	585,007	743,963	329,627	1,658,600	127	35·28	429,119	11	9
	8. Dumoh	2,457	379,236	375,471	322,941	1,077,648	99	35·20	255,547	10	9
	9. Seonee.....	3,608	587,794	393,377	430,499	1,411,670	66	41·64	220,306	6	0
	10. Mundla	4,719	353,429	720,546	379,370	1,453,345	204	24·32	63,279	2	10
	Total....	19,050	2,790,206	2,765,400	1,976,203	7,531,809	99	37·04	1,527,907	8	9
Nerbudda.	11. Hoshungabad	4,302	891,587	515,377	251,410	1,658,374	58	53·76	437,469	7	10
	12. Baitool	4,118	662,928	626,698	307,353	1,696,979	95	39·06	190,651	4	7
	13. Nursingpore ..	1,916	449,854	278,213	289,438	1,017,505	62	44·21	412,784	14	10
	14. Chindwarra ..	3,852	451,216	563,747	257,896	1,272,859	124	35·45	197,858	7	0
	15. Nimar	2,700	268,246	272,764	161,718	702,728	102	38·17	173,573	10	4
	Total....	16,888	2,823,831	2,256,799	1,267,815	6,348,445	80	44·48	1,412,335	7	0
Chuttees-ghur.	16. Raepore	11,043	1,991,098	2,602,836	1,497,400	6,091,334	131	32·69	552,922	4	5
	17. Belaspore	7,130	1,307,483	1,540,369	2,273,785	5,121,637	118	25·53	293,361	3	7
	18. Sumbulpore ..	4,200	1,612,800	691,200	384,000	2,688,000	43	60·	75,612	0	9
	Total....	22,373	4,911,381	4,834,405	4,155,185	13,900,971	98	35·33	921,895	3	0
	19. Upper Godavery.	1,926	44,538	86,816	56,478	187,832	195	23 71	31,493	11	3
	Grand Total..	82,880	13,810,196	14,447,772	10,106,226	38,364,194	105	36·	5,887,326	8	3
	Feudatory	28,261	5,726,720	3,527,680	8,832,649	18,087,049	61	31·66	111,957	0	4
	Grand Total Central Provinces	111,141	19,536,916	17,975,452	18,938,866	56,451,234	92	34 69	5,999,283	4	11

Cotton Commissioner's Office, Nagpore, 12th August 1869.

Capabilities of the Central Provinces.

Population.			Average Number of Cultivated Acres to		Number of Bullocks, Cows, &c.	Average number of Bullocks, &c., to every 10 acres of cultivated land.	Number of ploughs.	Number of cultivated acres to each plough.	Cotton cultivation.	Percentage of Cotton cultivation to cultivated area.	Ditto to arable uncultivated.
Agricultural.	Non-agricultural.	Total.	Each person.	Each agriculturist.							
276,457	362,884	639,341	1·50	3·2	237,610	2·5	38,570	24	86,081	9·1	20 83
193,910	414,570	608,480	1·35	4·7	314,571	3·9	54,710	15	..	..	..
252,771	284,524	537,295	1·12	2·2	381,845	6·3	43,294	14	39,169	6·46	1·57
186,179	157,306	343,485	2·19	4·	219,395	2·8	32,746	23	173,514	23 04	57·8
52,791	118,173	170,964	1·26	4·	86,085	4·	14,270	15	..	..	..
962,108	1,337,457	2,299,565	1·45	3 5	1,239,506	3·7	183,590	19	298,764	8 9	6 79
402,728	217,473	620,201	1·43	2·2	315,663	3·6	61,803	14	28,180	3·19	5 3
208,614	290,028	498,642	1·11	2·8	350,956	6·	61,982	9	24,389	4·03	3·28
135,645	126,996	262,641	1·5	2·8	343,084	9·	32,795	12	14,200	3 71	4·05
273,245	148,405	421,650	1·4	2·2	272,587	4·6	37,189	15	5,517	0·9	1·35
136,649	65,909	202,549	1·74	2·6	216,807	6·1	11,001	32	1,685	0·48	0·23
1,156,872	848,811	2,005,683	1·4	2·4	1,499,097	5·4	204,770	14	73,771	2·64	2·66
211,738	228,695	440,433	2·	4·1	276,101	3·9	50,718	29	16,708	1·87	3·24
160,649	97,686	258,335	2·5	4·1	240,240	3·6	22,736	29	537	0 08	0·09
156,952	179,844	336,796	1·3	2·8	209,301	4·6	27,072	16	61,828	13·74	2·22
165,037	131,816	296,853	1·5	2·7	226,307	5·	23,357	19	37,053	8·21	6·5
41,722	148,839	190,561	1·4	6 4	110,033	4·1	16,567	16	25,625	9 55	9·4
736,098	786,880	1,522,978	1·8	3·8	1,061,982	3·7	120,450	23	141,751	5·2	6·29
720,348	602,314	1,322,662	1 5	2·7	1,153,382	5·8	77,047	26	83,436	4·2	3·2
554,949	225,551	780,503	1·7	2·3	644,261	4 8	95,840	13	72,922	5·58	4·7
497,774	314,574	812,348	2·	3·2	209,439	1·3	52,240	31	79,540	4·1	11·51
1,773,071	1,142,442	2,915,513	1·7	2·7	2,007,082	4 1	225,127	22	235,898	4·8	4·89
169,606	154,764	324,364	0·1	0·3	34,858	7·8	4,537	10	691	1·55	0·79
4,797,749	4,270,354	9,068,103	1·5	2·9	5,842,525	4·2	738,474	18	750,875	5·44	5·2
231,504	862,138	1,093,642									
5,029,253	5,132,492	10,161,745									

H. RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

E.

STATEMENT showing the

Divisions.	Districts.	Area in square miles.	Area in Acres.				Proportion of cultivated to uncultivated arable land.	Percentage of cultivation on area.	Total land revenue.
			Cultivated.	Arable uncultivated.	Forest or Waste.	Total.			
									Rs.
West Berar.	Akola.....	3,396	1,610,122	616,195	466,014	2,692,331	100 to 38	59·8	1,774,071
	Mehkur....	3,013	893,064	507,042	639,093	2,039,199	„ 56	43·7	674,540
East Berar.	Oomraotee..	5,415	1,503,999	447,619	2,326,868	4,278,486	„ 29	33·	1,388,653
	Ellichpoor..								
	Woon.....	5,510	696,433	510,348	700,000	1,906,781	„ 73	36·5	417,045
	Total..	17,334	4,703,618	2,081,204	4,131,975	10,916,797	„ 44	43·1	4,254,309

Cotton Commissioner's Office, Nagpore, 12*th August* 1869.

Agricultural Capabilities of the Berars.

Average per acre.	Population.			Adult males engaged in agriculture.	Average Number of cultivated Acres to		Average number of persons engaged in agriculture to every 10 acres of cultivated land.	Cotton cultivation.	Percentage of cotton cultivation on cultivated area.	Percentage of cotton cultivation on arable uncultivated.
	Agricultural.	Non-agricultural.	Total.		Each person.	Each agricultural male adult.				
Rs. a. p.										
1 1 7	464,153	184,981	649,134	152,850	2·4	10·5	2·8	664,226	26·5	60·1
0 12 1	203,142	150,294	353,436	64,227	2·5	13·9	2·3			
0 14 9	436,461	315,173	751,634	148,024	2·	10·1	2·9	622,516	28·2	64·9
0 9 6	265,820	211,541	477,361	83,222	1·4	8·3	3·8			
0 14 5	1,369,576	861,989	2,231,565	448,323	2·1	10·4	2·9	1,286,742	27·3	61·8

H. RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

13. The Statement given at page 15, extracted from the same source, gives the figures for each District in detail, and shows where cotton holds its own and is grown for export, where it gives way before wheat and rice and is raised in small quantities for local consumption only, and where the cultivation is altogether unknown. The Districts will all be found to be numbered and given in the same order as the Statement **E**, containing further agricultural statistics, and those who care to pursue the subject further will, by reference to this Statement, find the number of farm cattle (not including horses, goats, &c.,) available in the rich cotton-growing country of Wurdah, the number of acres to each agriculturist, the average extent of land which each plough has to work and other details.

14. I am confident that every one who examines these statistics must be impressed with the rough and scanty materials with which our agricultural system is worked. The cattle includes the cows and calves in great numbers, which are not available for agriculture. Indeed in most districts the average area to each plough, *i. e.* a plough and one pair of bullocks capable of dragging the plough, is 24 acres. Where the stock is so scanty, the difficulties which impede any attempts to encourage deep ploughing and other improvements are very great (a pair of bullocks with 24 acres to look after may well be excused if they prefer scraping the ground with a "*bukhur,*" or light grubber, to toiling through the heavy black cotton soil with the "*nágar,*" or deep plough); and for the same reason the deficiency of stock renders it almost impossible to manure the land to any great extent, more especially as in the highly cultivated country, where manure is most wanted, there wood and jungle is the scarcest, and there of necessity the people have to use the cowdung for fuel. In many other respects, too, the statistics are eloquent and instructive. For instance, they show that in Chanda and Bhundara a plough is required to every 15 acres, whereas in the neighbouring districts of Nagpore and Wurdah a pair of bullocks does nearly double the work. But this reminds one that here, as the annexed copy of a Geological map by the late Mr. Hislop will show, one has left the black cotton soil of the Deccan,* and got on to the sandstone formation, with its tanks and irrigation, and extensive tracts of rice and sugar-cane cultivation, requiring much more careful working than the

Rough and scanty machinery of our agricultural system.

* The Chanda District includes both formations, and to the west, with the trap, is found excellent cotton.

II.

Geological Map
of the
NAGPORE Country.

II.

Geological Map
of the
NAGPORE Country.

Crops Cultivated in Acres, Actual or Approximate.

No.	Districts.	Rice.	Wheat.	Other food grains.	Oil-seed.	Sugar-cane.	Opium.	Indigo.	Fibres.	Tobacco.	Vegetables.	All other crops not included in the above.	Cotton.
1	Nagpore.....	15,721	269,983	599,976	97,387	1,617	193	..	697	474	8,124	3,251	86,081
2	Bhundara	513,019	86,064	147,982	27,068	12,561	..	..	197	558	2,128	344	..
3	Chanda	253,161	75,253	276,884	51,897	4,074	..	..	613	1,283	7,795	..	39,169
4	Wurdah.....	365	181,293	377,679	90,627	262	641	..	190	1,231	2,664	3,882	173,514
5	Balaghat	178,405	5,834	14,324	2,591	775	..	..	4	745	114	..	..
6	Jubbulpore	134,475	210,648	313,976	26,983	3,324	311	..	1,336	391	994	3,653	28,180
7	Saugor	9,038	440,053	150,904	11,487	2,742	37	209	1,501	120	1,924	1,106	24,389
8	Dumoh	37,836	198,347	159,242	13,423	1,492	87	22	578	134	861	1,278	14,200
9	Mundla	49,630	52,616	205,567	23,555	1,663	59	..	646	434	434	..	1,685
10	Seonee	218,779	267,588	144,400	19,761	3,234	121	..	1,030	93	148	210	5,317
11	Hoshungabad ..	22,672	470,560	409,008	25,983	1,580	920	..	2,014	3,146	3,290	..	16,708
12	Baitool	16,273	223,964	409,155	64,327	8,512	3,912	..	5,619	358	..	..	538
13	Nursingpore	15,270	143,266	239,212	4,810	5,200	60	19	1,017	872	572	873	61,828
14	Nimar	7,463	11,200	251,619	18,086	572	299	..	647	354	1,706	..	25,625
15	Chindwara.....	671	159,772	370,852	30,830	5,326	1,392	..	..	..	1,426	..	37,053
16	Raepore.....	510,714	249,706	375,406	180,280	35,826	535	..	1,910	6,903	13,973	..	83,436
17	Belaspore	882,218	79,203	225,443	56,039	6,888	124	..	..	2,317	12,329	..	72,922
18	Upper Godavery.	12,520	143	32,240	1,033	20	..	..	20	444	152	..	691
	Total....	2,899,230	3,125,493	4,694,869	745,237	95,668	8,682	250	18,019	19,857	58,634	14,597	671,336

easily-managed and accommodating black soil. With the help of the enlarged District map of the Central Provinces and the Berars, the position and prospects of our cotton trade may be read at a glance. Where we have the Railway with the black cotton soil, there high prices and enterprising cotton merchants ensure a considerable portion of the cultivated land being sown annually with cotton. But pass the black cotton soil, as for instance in Bhundara, close to Nagpore, not one single acre is devoted to the crop. In the Nerbudda Valley the soil is rich, but clogs with the rain, and is thus better adapted for a spring harvest. But the advent of the Railway is beginning by degrees to impress upon the cultivators the advantages of cotton. The Nerbudda Valley is, however, the great granary of the Central Provinces, and as the proximity of the large native States ensures a constant demand for grain, cotton will have a hard battle to fight to gain the upper hand. Then there are again other and more remote districts, where not only is the land well adapted to cotton, but where the immense tracts of land lying waste would admit of the almost indefinite extension of the cultivation. Here, however, the population is scant, trade is dull, and what cultivation there is, is almost entirely confined to cereals. And the extension of cotton cultivation in this quarter will be dependent on the general progress of the country, the increase of the population, and the increase of intelligence among the people, which will provide them with both the means and the desire to extend the trade. At present the great difficulty in the way of increasing the cotton supply is the scanty population and the want of capital in these Provinces. A larger population is required to admit of more land being broken up, and to increase the productive power of the land capital is indispensable. This, to some extent, can be supplied by Government, as, for instance, in the case of irrigation, and the subject will be found treated of at greater length in Chapter IV. of this Report.

15. For the Berars, the figures I am able to give are not quite so full, but they will be found to be exceedingly interesting. Mr. Lyall's Report has supplied me with, amongst other details, a column showing the number of cultivated acres in the Berars to each agricultural adult; and it will be seen that on an average there is but one adult male cultivator to every ten acres of cultivated land, and that, taking men, women, and children of the agricultural class all together, the average is three to the ten acres. The last Administration

Agricultural statistics of the Berars.

III.

Captain Meadows Taylor's

Map of the BERARS.

III.

Captain Meadows Taylor's
Map of the BERARS.

Report shows the proportion of the different crops in the Berars to be as follows:—

	Per cent.
Cotton	27
Jowaree and other cereals, and oil-seeds, &c.	71
Garden cultivation	2
	100

and these figures, when an allowance is made for the rotation of crops, do not give much margin for the extension of cotton cultivation.

16. The little map which faces this page was obligingly sent to me by Captain Meadows Taylor, C.S.I., who for many years did so much in the Berars to improve the cultivation of cotton, and whose interest in the subject has in no wise been diminished by his retirement from the service. The remarks on the soil and geological features of the Berars, which accompanied the map, indicate so clearly the best cotton-growing country, that I may be excused for reproducing them here.

Captain Meadows Taylor says* :—

Captain Meadows Taylor's notes on the cotton tract.

"To the north of the Berars the Sautpoora Hills rise to a height of 3,000 to 3,800 feet above the sea, or from 2,200 to 3,000 feet above the valley. The ridge is narrow and irregular, and descending to the Taptee on the north, in deep ravines clothed with dense jungle, in which teak to some size is found, the whole tract having a very sparse population of "Gonds" and "Gowlees" (herdsmen), and but little cultivation. The descent to the valley on the south side is more abrupt, the mountains having steep scarped faces of prismatic basalt, and the culturable soil is met with close to the end of the spurs, which, thickly wooded, descend into the plain. The mountains are exclusively of basalt; but eastwards from near Ellichpoor, sandstone is met with through which the basalt has burst, at the period of the elevation of these mountains, as appears by the distortion of the sandstone strata, and their partial vitrifaction when in contact with the basalt.

"On the south side of the valley the elevation of the hills is not so great, not exceeding 800 feet at any point, nor is the ascent so abrupt. It is, in fact, the summit of one of the great Deccan plateaux, and descends to the valley by a series of steps on the north side, sloping very gently to the Wurdah and Godavery on the south and east.

* In a paper read before the Royal Asiatic Society.

"The valley between these ranges has a very rich soil of great depth. Towards the hills on both sides it becomes shallower and rests upon the basalt, which here and there crops out above the surface; but towards the centre of the valley no rock whatever is met with, and the banks of the Poornah River show escarpments of pure black soil of from 30 to 50 feet deep, while in the salt wells of Dehunda, nothing but black earth and yellowish clay is met with to a depth of 120 feet.

"The whole of the valley is available for cotton cultivation, although the soil towards the hills on both sides is gravelly, occasionally even stony, yet the crops of cotton are as fine, if not indeed finer, than those on purely black soil in the centre of the valley but the gravelly soils require a different species of cotton, which has not quite so high a value as that grown upon the purely black soil, though, if the season be favourable as to rain, the produce is much larger.

"In the attached map, I have endeavoured to show the areas of cotton-producing lands on both sides of the valley of North Berar; the grey colour denotes the gravelly soils, which are composed of nodules of trap and of lime kunkur mixed with coarse agates, chalcedonies, &c. It is often shallow and very light in quality, not retaining moisture; but the better qualities are a rich brown loam, resting upon beds of kunkurs, or with the shallow portions upon the basalt below. Thus in North Berar, as the centre of the valley is reached, the substratum rock is found at a greater and greater depth, till it disappears as far as 120 to 140 feet, and the deep beds of black soil or regur are found to be resting upon yellowish and greyish white clays intermixed with beds of gravel. These portions are coloured yellow.

"The soil of the southern portions of both Provinces—what, in fact, constituted the former district of South Berar—is very different, and for the most part is unsuited to cotton cultivation, of which, comparatively speaking, there is very little. The soil near the top of the plateau is much denuded, and comparatively very shallow, except in the low bottoms of the narrow valleys, where occasional fields of cotton are met with. When the soil, however, is good, grain grows better than cotton, for which perhaps the climate is too harsh; and I have observed in all the high plateaux of the Deccan that cotton grows indifferently, is uncertain in produce, of a rough staple, yields comparatively a small return per acre, and, in fact, is grown more for local consumption than for exportation. This perhaps results from the comparatively high elevation of these plateaux. North Berar, which is essentially a cotton-producing

district, has an elevation in the valley of from 800 to 900 feet above the level of the sea, whereas the plateaux lying to the south is from 1,600 to 2,000 feet. North Berar is a very moist, damp climate; South Berar, on the contrary, dry and more uncertain as to falls of rain than the northern districts.

"On all the small hills in the southern part of the district, a low scrubby jungle prevails, and grows on a soil which is unfit for agriculture of any kind; and as these hills cover a very large proportion of the area, the population is proportionately sparse. On the Wurdah, south-east of Oomraotee, there is a good deal of fine grass land, all waste, with hardly any population, which might possibly be available for cotton to some extent. It would be difficult, however, to induce people to settle on it and to build new villages, or even to break up lands which have been so long waste. I have coloured this portion of the tract yellow, and the rest, in which cotton grows, are uncoloured."

17. Since Captain Meadows Taylor wrote the above, much of the jungle tract in the Woon country has been brought under cultivation with the help of waste land rules drawn up by Captain Hudleston, late Deputy Commissioner of the Woon District. The cultivators there are chiefly Brinjarahs, or of the carrier class, who possess vast herds of cattle, once used for carriage, the loads being slung pannier-fashion on the backs of the bullocks,—the class of people on whom General Wellesley, when in the Berars, depended for the supply of grain for his troops, and on whom, at a later period, the cotton merchant was long dependent for the transport of his cotton from the interior to the sea-board. Like the old stage-coachmen, they, too, have been thrown out of employment by the Railway and improved communications, and both they and their bullocks now afford valuable co-operation in the cause of the extension of cotton cultivation.

SECTION II.

EFFECT ON THE COTTON CROP OF THE MONSOON OF 1868-69.

18. Before considering the exports from our Provinces and the cotton trade of 1868-69, the monsoon of the past season calls for notice, for obviously on the state of the weather must depend both the out-turn and the quality of our crop.

19. Unfortunately for the operations of my Department, the two rainy seasons during which I have held my present appointment have been notably capricious, and each in its particular way disastrous to agricultural operations in general. My last report showed how—our average rainfall for the year being about 39 inches—we were deluged by a four months' downpour, which exceeded 58 inches, whilst in January again, the monsoon revisited these Provinces in a manner altogether unprecedented. The heavy rain in the first instance rotted much of the young crop, so that the cultivators, ploughing up the fields, prepared them for the spring harvest, whilst the unforeseen return of the monsoon stained and damaged much of the ripe cotton. This season we very nearly had a "short" crop and an inferior class of cotton from exactly opposite causes. As if we had had more than our share of rain during the preceding year, the monsoon of 1868-69 was as scant as its predecessor was severe. And although the effects of this extraordinary season were, fortunately, not of the unfavourable nature that, at first, was not unnaturally apprehended, still it is desirable, I think, to refer to this drought (which so injuriously affected the grain crop, and will long be remembered in many parts of India), if it is only to record the triumph achieved by our indigenous cotton plant, and to explain why the people of this part of India prefer, not unwisely perhaps, this their hardy little crop to the produce of any exotic seed.

Contrast between the rainy seasons of 1867-68 and 1868-69.

20. In these Provinces, although the native "season" dates from the 5th of June (the 1st day of Mroog), the monsoon is seldom known

to commence before the 15th of the month, and the weather is generally expected to change at the first new moon about that period. In 1868 the rains came upon us most unexpectedly on the 5th of June, the natives' own day, and continued until the 11th of the month, 6 inches of rain falling within the week. I happened to be in the Berars at the time, and had an opportunity of noting the effect of the unlooked for burst. The cultivators, in most cases, were utterly unprepared for it, and had not made much progress with their fields; but the rain brought out all the men and bullocks that were available, and all the land that had not had the "*bukhur*," or native light grubber, run over it, was got into order as hastily as possible, and sowing operations were commenced after the break of fine weather of the 11th of June, or nearly a fortnight before the usual time. In some parts an idea got about that the Rains had not really commenced; that this was but a freak of the monsoon, such as that which in January had done so much damage to the crop, and sowings were postponed until the next fall. Fortunately, however, as the result proved, these cases were not very numerous. After this short but heavy burst the weather cleared up, and, with the exception of a few slight and partial showers, no rain fell in the Berars for nearly five weeks. The days were particularly bright and hot, and the fierce sun soon began to tell on the young plant, which was just making its appearance above the ground, and the delay in the return of the rain occasioned considerable alarm. To give an idea of the anxiety regarding the safety of the crop then entertained, I can hardly do better than quote from my letter to the Secretary to the Chamber of Commerce, written from the Berars at the time when the circumstances were fresh in my memory.

Early burst of the monsoon.

State of the weather in the Berars.

21. Under date the 10th of July 1868, I said—

"This season the cotton had hardly been cleared out of the markets before our cares with the new crop commenced. The weather has already shown serious symptoms of eccentricity, and the present want of rain is causing no inconsiderable anxiety to the cultivators and all interested in the cotton trade.

"The heavy rain commenced on the 4th of June, quite ten days earlier than it was expected, as in these Provinces the monsoon seldom breaks before the 14th or 15th of the month. The accompany-

ing figures,* for which I am indebted to Dr. Porter, the Civil Surgeon of Akola, will show that the rainfall, during the few days that this wet weather lasted, was unusually heavy; six inches of rain, or nearly one-fifth of the average annual rainfall, having been registered in eight days. For the first four days the wind was from the N·E., which suggested that perhaps this was not the regular monsoon, but merely a return of the eccentric and unseasonable rain of January. But on the 10th the wind veered round to the S.W., bringing with it a still heavier downpour, and leaving little doubt that the monsoon was upon us. This weather continued until the 11th, when the clouds cleared off, and since that date the days have been bright and hot, and, with the exception of one or two slight showers, no rain has fallen.

*June 4th	0·20
„ 5th	0·24
„ 6th	0· 5
„ 7th	0·34
„ 8th	1· 5
„ 9th	0·50
„ 10th	2·42
„ 11th	1·17
	5·97

12th June to 10th July no rain registered.

"The sudden rain took most of the cultivators by surprise. They expected at least another week's fine weather before the commencement of the monsoon, and when the rain came down many of the fields had yet to be got into order before the sowings could be commenced. In most places where the fields were ready the seed was put in at once, and doubtless a very large proportion of the cotton crop was sown during the first few days of the present break. But where the work was not so forward, advantage was taken of the fine weather to prepare the fields to receive the next burst of rain, and all further sowings were deferred. For upwards of five weeks now the cultivators have been anxiously expecting the rain, of which, save the few slight showers already noticed, there has been no sign.

"I fear that this most unusual weather cannot fail to affect in some degree the next season's crop of cotton. This morning several intelligent landholders have been here, and they all express alarm for the crops of the autumn harvest. In regard to the cotton, about 10 annas in the Rupee (5-8ths) of the crop, say they, have been put into the ground, and the remainder cannot be sown until the rain falls. The young cotton, on the whole, is doing well; the few days' rain was so heavy that the ground was saturated and the heat was thoroughly driven out of it; and thus, they say, the plant has been able, as yet, to stand this long succession of bright hot days. In the light stony soil, which does not retain the moisture well, it has already gone hard with the cotton, much of which is sickly and poor. All agree that rain is urgently required. If it comes within the next four or five days, say

they, the greater part of the crop will be saved; the cotton in the good ground can certainly hold out for a little longer; as for the fields that have already suffered, they can be resown. But all agree that this want of rain will tell against the crop. The Deshmook, the head landholder of this place, says truly, that, what with the fields that either have yet to be sown, or will require to be resown, a considerable portion of the crop has been thrown back at least a month, and however favourable the season may yet prove, still the delay in getting the seed into the ground will, he fears, tell in the end, and the plants will hardly be as strong and lusty and fruitful as they might otherwise have been.

"My own observation, during my rides in the neighbourhood of this place, confirms the opinion given above. In the good soil the plants look wonderfully well, considering every thing. In inferior ground, decay is already noticeable. Until within just the last day or so, the grass on the hills, and all the vegetation which followed the downpour of June, kept fresh and bright, showing that, notwithstanding the heat, there has been sufficient of moisture to draw upon. But I have noticed a gradual change in the colouring of the hills; and if the rains keep off much longer, this place will soon resume the well-known burnt-up appearance which it presents during the cotton season, and the cotton crop will hardly be able to hold out much longer than the other vegetation. In fact, the next week will be an anxious one. If the rain comes back to us within that time, the cotton will, it is to be hoped, escape serious injury. A continuance for another ten days of the weather we are now having will have the worst effects."

22. The anxiety was indeed very great; luckily, however, on the morning of the 12th, or nearly five weeks from the date of the last fall of rain, the long-looked for monsoon returned, and on the 22nd of July I was able to make the following much less unsatisfactory report:—

"The rain came just in time. It has not been very heavy; and this is lucky, as the people have thus been able to get on with the sowing, with which very heavy rain would have interfered, and the weather now looks settled for rain, and seems likely to be less capricious than it has hitherto shown itself. More cheerful accounts have been received from all the districts.

"The accounts from the Berars are, I am thankful to say, cheering, and the District reports show that the change in the weather

has been general. The rain did not return a day too soon, and it is hardly pleasant to think of the great damage that a continuance of the dry weather might have occasioned. The rainfall at Khangaon during the last week was about three inches, and this may be taken to represent the state of the weather in the Poornah Valley during that period. My accounts from thence represent the cultivators to be in high spirits. All are busy either sowing or resowing the cotton; and as, fortunately, the soil of the Berars is rich, and retains the moisture well, the latter operation will not be rendered generally necessary. The rain comes on in the evening; during the day there are occasional gleams of sunshine to comfort and encourage the young plants, which in most places are now looking fresh and healthy.

"On the whole, I am inclined to consider the prospect of the crop to be favourable. We have had a narrow escape from a calamity, for although it is true that, even if the rain had held off for a fortnight longer, the resowings, which would then have become general, would have prevented the utter failure of the crop; still it is to be remembered that these operations would have entailed much trouble and expense on the cultivators, and would have tended to discourage them. Moreover, the sowings of the jowaree would have been still further delayed, and this might have told seriously against the grain crop. There are always landholders from all parts of the provinces at Nagpore; during the last few days several have been to see me, and with them the prospects of the harvest have been discussed. The Koonbee cultivator is not, as a rule, inclined to take the brightest view of matters, and it is a favourable sign to find him in a good humour with the weather. My friends say that, if the rain will only continue in a reasonable manner, every thing will go well. A Chanda man suggested that the rice had suffered; but the Wurdah Patels—I fear they had had no great interest in rice—said there was plenty of time now to resow, and the weather gave the rice people every chance. In the Hinguughat country the cotton was nearly all sown, they say, early in June; the rain returned just in time, and the plants are doing well. In the Berars the delay in sowing a great part of the crop may, I fear, tell to some extent against the out-turn; but we must hope that the damage thus occasioned may be made up for by the continuance of the present weather, which is favourable to the cotton sown early in the season.

"All agree that the long break of fine weather gave the cultivators an opportunity of getting their fields into excellent order; and some think that the abundunt leisure to prepare the ground

that all have had, may result in the area of the cultivation being extended. But in the great cotton fields of East and West Berar, I fear this is hardly likely to be the case. On the contrary, it is an undoubted fact that some of the farmers who, during the last few years, took up much land are beginning to draw in their horns, but if more careful cultivation results from this move the out-turn will hardly be affected. It is not possible, as yet, to give the returns of the area sown with cotton this season; but from the inquiries made, and from my own observation, I should think that matters will remain on about the same footing as last year, and that if the weather only continues as at present, no diminution in the exports need be apprehended.

"The delay in the setting in of the rain will undoubtedly be of advantage to the crops of the spring harvest. The cultivators have had plenty of time to prepare their fields for the 'Rubbee' crop, as this is called. Last year the heavy and continuous downpour rendered all agricultural operation almost impossible, and the wheat suffered equally with the cotton, and the crops of the autumn harvest."

23. The remarks regarding the weather in the Poornah Valley apply equally to the cotton-growing tracts of the Central Provinces, in the Wurdah Valley lying south of Nagpore. Here, too, there was heavy rain early in June, and then a long anxious break in the weather, which threatened to scorch up the young cotton; and I would again refer to extracts from my letters to the Chamber of Commerce, which, written as they were at the time, and on the spot, are more likely to convey a correct idea of the season through which the crop triumphantly passed, than any description I might now attempt. My first Report, dated 10th July 1868, ran in the following not very hopeful terms:—

In the Central Provinces.

"The accounts received from the Central Provinces are, I regret to say, hardly more promising. Whilst in Lower Bengal the weather has been unusually severe, and much harm has, according to all accounts, been caused by the floods, the rain appears to have altogether forsaken North-Western and Central India. The returns from the cotton-growing districts show a few inches of rain early in June, corresponding with the weather in Berar already noticed, but since then there has apparently been a return of the hot weather. Mr. Melville, of the firm of Messrs. Warwick & Co., writing to me from Hingunghat under date the 2nd July, says 'we have had a very long break of fair weather, and should it continue much longer I fear it will result in the loss of the

seed already sown. The weather is hot enough now to wither all the young plants.'"

A fortnight later I was able to write the following more cheerful account:—

"There has been rain in Wurdah and in Chanda, the chief cotton-growing tracts of the Central Provinces, but it did not arrive too soon. Mr. Melville, who watches the effects of the weather very carefully, and whose opinion I have quoted in my former letter, writes to me from Hingunghat under date the 14th July:—

'Fortunately we have lately had most favourable weather for the cotton crop—just enough rain, and no more; cloudy weather, with occasional gleams of sunshine.'

"On the 5th July, Captain Lucie Smith, the Deputy Commissioner of Chanda, wrote:—

'Rain is urgently wanted; unless it fall speedily, the rice, jowaree, toor, tillee, and cotton already sown will be destroyed.'

"I have just received from him the following much more cheerful account, under date the 5th instant. He says:—

'The rain which fell during the week has saved the greater part of the seed sown; where the rice has been wholly destroyed, fresh sowings will be made.'

"Rain was much wanted in the Nerbudda Valley. Fortunately it fell there about the time it appeared here, and more favourable reports of the crops are being received. With the rain, too, Cholera, which threatened to become general, and which had extended to the Berars, seems to have disappeared.

"The accompanying Statement of the rainfall at Nagpore,* with which Dr. Townsend, the Sanitary Commissioner, has kindly furnished me, will convey a sufficiently correct idea of the state of the weather throughout the chief cotton-growing tracts of the Central Provinces this season. It will be seen that since the 1st of June last, up to date, we have had 7·22 inches of rain here, which, added to the unreasonable and damaging downpour of January last, long to be remembered by cotton merchants, gives 13·43 inches since the commencement of the year. The monsoon of 1867

Rainfall at Nagpore.

	1867 In. Cts.	1868 In. Cts.
January	0 0	4·84
February	0·0	0·0
March	0·34	0·72
April	0·60	0·0
May	1·4	0·65
June	14·50	4·0
July 1st to 18th	11·30	3·22
	27·28	13·43

set in on the 16th of June, and within the last month 25½ inches of rain fell; and as the average annual rainfall in this part of India is 39·75 inches, of which about 30 inches generally falls between the 15th of June and the 15th of September, the commencement of this season's monsoon has been about as light, as that of last year was severe."

24. But our anxieties did not end here. The extraordinary season of 1868 is well known to all who take any interest in the affairs of India. The doubt as to the out-turn of the cotton was but a small matter compared with the grave anxiety entertained for all the grain crops, and the threatened famine and distress from which these Provinces were barely saved. The following Statement **F** shows the rainfall in the Berars from June 1868 up to the arrival of the monsoon of 1869, which has only recently commenced. There was thus heavy and unlooked for rain early in June. Then a break of five weeks. Rain fell irregularly during July; in August the downpour was rather heavier, with the exception of two slight showers on the 10th and 11th. The register for September is quite blank; and then for the rest of the season there was no rain at all. The "later rains," for which the cultivators so anxiously look to refresh the plant at its most critical time,—the showers of Christmas and January,—utterly failed us. It was hardly unnatural then that at the close of the year some anxiety should have been entertained regarding the out-turn of the crop, which has passed through so exceptional a season. In the Berars the general impression was that the dryness of the weather would affect the second pickings, though the cotton in the rich moisture-retaining land, of which the Poornah Valley is chiefly composed, was declared to be in good condition. From the Wurdah Valley the reports were from the first satisfactory, and a hope was all along entertained that a bumper crop of "Hingunghat" would make up any deficiency in the supplies of "Oomraotee." From the Northern and Eastern Districts the reports were not so favourable; for the season, which destroyed many of the grain crops, and thronged the towns with a starving population, could not but leave its trace on the cotton lands.

Great anxiety regarding the crops.

25. The following Statement also contrasts the last rainy season with the monsoons of former years. I have only to add that, notwithstanding the drought, and the anxieties regarding the cotton crop, the out-turn for the Central Provinces and the Berars was an excellent

Triumph of the indigenous cotton.

F.

STATEMENT showing the Annual Rainfall in the Central Provinces from 1854 *to* 1868.

Years.	Months.																	
	January.			February.			March.			April.			May.			June.		
	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.
1854		..			..			..			..		0	6	7	6	4	3
1855	0	9	8	0	4	5	0	5	2	0	1	1		..		5	4	0
1856		..			..			..			..		2	0	3	7	2	0
1857	0	1	4	0	0	6	0	0	4	0	6	2	1	9	1	10	5	2
1858	2	0	7	0	4	1		..			..		0	8	4	3	8	5
1859		..			..			..		3	9	3	0	2	8	6	5	9
1860		..		0	4	1	0	0	5	0	1	5	4	7	6	15	2	3
1861	3	1	1		..		0	5	4		..		1	3	5	13	8	4
1862	0	1	2		..			..		0	0	5	0	9	8	10	4	8
1863	0	1	2		..		1	5	9		..		0	5	2	10	4	4
1864		..			..			..		0	7	4	1	9	5	7	3	1
1865		..		1	9	0	3	6	0	1	3	0	1	0	0	10	6	0
1866		..			..			..			..			..		6	2	0
1867		..			..		0	3	4	2	7	0	1	5	0	14	7	4
1868	4	8	4		..		0	7	2		..		0	6	5	4	0	0

Years.	Months.																		Total.		
	July.			August.			September.			October.			November			December					
	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.	Inches.	Tenths.	Parts.
1854	24	8	1	4	4	4	9	5	7	3	1	3		..			..		49	5	0
1855	7	5	0	3	6	0	4	4	5	3	0	9		..			..		26	1	0
1856	24	0	0	10	0	2	2	7	9	0	3	2		..			..		36	3	6
1857	4	4	6	8	5	6	7	1	7	2	7	5		..			..		36	2	3
1858	11	9	6	5	8	8	9	6	0	0	5	8		..			..		35	1	9
1859	6	3	6	14	9	4	1	5	1	0	0	8		..		0	7	1	34	4	0
1860	8	7	2	15	7	6	0	0	3		..			..			..		45	1	1
1861	17	1	6	8	6	3	1	2	6		..			..			..		45	8	9
1862	8	5	7	11	0	2	9	6	6	3	5	6	1	0	7	0	3	1	45	8	2
1863	15	6	4	4	2	4	6	5	1	0	6	1		..			..		39	6	2
1864	9	1	0	8	5	2	4	0	0		..		0	9	7		..		32	6	2
1865	13	4	6	8	6	0	3	7	0	1	8	0	0	5	0		..		46	4	6
1866	10	1	10	14	4	2	8	8	9	1	4	0		..		0	2	0	41	1	1
1867	11	8	2	11	1	0	15	3	6	1	5	3		..			..		59	1	0
1868	8	8	7	4	6	6	1	6	7	0	0	8		..			..		25	4	9

NOTE.—Rainfall in 1869 amounts to 16·55 up to date as detailed below :—

	Ins.	Tenths.	Parts.
In January....		......	
,, February ..		......	
,, March	0	6	8
,, April	0	2	0
,, May		......	
,, June	4	1	2
,, July	8	6	2
,, August* ..	2	9	3
Total..	16	5	5

* Up to 16th August 1869.

H. RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

one, and in quality quite up to the average of former seasons. Whereas, in proof of the satisfactory out-turn of the crop, I would now desire to proceed to examine the figures of the exports from the Central Provinces and the Berars during the past seasons, given in detail in the following Chapter.

Importance of watching the seasons.

26. I have purposely dwelt at length on the circumstances of the last rainy season. In regard to the past, these details are not of much use perhaps, it may be said; and it may also be suggested that some account of the present season, and a precast of the coming crop, would be more acceptable here. But this information I have tried to give, and in the postscript to this Report will be found the latest intelligence up to date.

27. But the study of past seasons, and the effect on the crop, cannot well fail to be a matter of interest to all connected with the trade; and these details will perhaps assist them in forming an idea of cotton prospects in future years. But in addition to this, I have a particular object in dwelling upon the past monsoon, for if I have in any way succeeded in explaining how unsatisfactory was the season, then, when the excellence of the out-turn of the crop is established, it will not be difficult to realize how hardy the cotton plant is, and why the crop is so popular with the cultivators of this part of India.

SECTION III.

EXPORTS OF COTTON.

I.—From the Central Provinces.

28. In my former report it was shown that, thanks to the American war, and the facilities with which trade can now be conducted in these no-longer-inaccessible Provinces, the average annual exports of cotton have amounted to about 60,000 bales from the Central Provinces and 200,000 bales from the Berars, of which quantity about 10,000 bales of the Central Provinces crop went eastward; the remainder, including the whole of the Berar produce, going to Bombay. Owing to the unusual monsoon of 1867-68, the total exports from the Central Provinces amounted last season to but 35,000 bales, or considerably less than what, under ordinary circumstances, would have been claimed by the Bombay market alone. The Berar exports amounted to about 207,000 bales, still leaving the total exports of the Provinces considerably below the average, which, as already shown, may be taken to be rather more than $\frac{1}{4}$ of a million of bales, or one quarter of the average annual exports from the port of Bombay.

Exports of former years considered.

29. I have attempted, with the assistance of the accompanying map, to show, at a glance, the consumption and exports of the several districts of these Provinces, and the routes taken by the trade. In a tracing of the same map will be found marked the different crops and the various natural products for which the country adjoining the cotton tracts is chiefly noted, and which have a direct and important bearing on our cotton trade.

Map of the routes taken by our cotton.

30. The exports from the Central Provinces by the several routes of traffic are given side by side with the exports of the preceding year in the following Statement:—

IV.

Map Showing the Cotton Cultivation and Exports.

IV.

Map Showing the Cotton Cultivation and Exports.

STATEMENT showing the quantity of Cotton exported from the Central Provinces during the year 1868-69, *as compared with the year* 1867-68.

	* Bales 1867-68.	Bales 1868-69.
Exports by Railway from the Nagpore and Wurdah Districts to Bombay	5,500	31,000
Carted across to the Berars	6,000	7,000
Exported to Bombay by the Nerbuddá Valley.	12,000	11,800
Exported from the Wurdah and Nerbudda Valley to Bengal	10,500	5,100
Sent direct by the Eastern Districts to Bengal and Southern India	5,500	9,100
	39,500	64,000
Deduct Imports about	3,700	10,000
Total Exports about	35,800	54,000

31. Compared with those of the previous seasons, the great feature in this season's returns is the increase in the quantity exported, which, making allowance for the contributions from neighbouring territory, has increased from 35,000 to 54,000 bales, or nearly 55 per cent. The allowance in question is made on account of cotton brought into the Central Provinces in order to get the stamp of the good name of a market such as Hingunghat, or which of necessity passes through our territory on its road to Bombay or Mirzapore. Thus during the year

The exports of the past season.

* The "bales" noticed throughout this report are bales of ½ a kandy, or say 400 lbs. each.

under report 8,000 bales were brought to us across the Wurdah from Berar and the Nizam's territory, whereas 2,000 bales passed through the Nerbudda Valley on their way from Central India to Bombay or the markets of the North-Western Provinces.

32. The next most noticeable point in the return is that the great increase in the exports has been from the Wurdah Valley. The Hingunghat crop was good, and the exports were nearly six times the amount of the scanty supply of the preceding year; the Berars and the Nizam's country sent us more than in the season of 1867-68; the exports from the Eastern districts towards Orissa increased; and a new feature in the season's operations is that a consignment of cotton was sent down the Godavery to Coconada, the cotton having been purchased in the Chanda District and in the neighbouring territory of His Highness the Nizam by a member of a European firm from Coconada. This subject will be found referred to more at length in a later paragraph of this report. It is also particularly to be noted that the quantity of cotton sent eastwards to Mirzapore sunk this season from 10,500 bales, the figures of last year, to 5,100, the total exports for 1868-69. This is to be accounted for by the circumstance that the large export of Hingunghat cotton to supply the manufactures of the North-Western Provinces was quite an exceptional event, as described in my report of last year, and that this year the demand for cotton on the Bombay side being very brisk, the trade has again flowed through its original and most natural channel. Moreover, the very unfavourable season in the northern districts damaged the cotton crop and reduced the quantity available for export.

Change in the traffic.

33. Below will be found the exports from the Central Provinces during the last few years: the figures have been taken from the old reports. I am inclined to think that the exports were during those seasons overestimated, and this is hardly a matter of surprise, when it is remembered how difficult it must have been to frame an estimate in those days. The "bales" of this season noticed throughout this report are bales of half a Bombay kandy, or $3\frac{1}{2}$ cwt. of cotton nett (392lbs.); and the calculation of the quantity carried by Railway has been made with some care, as explained in the foot-note to page 37. The bales of former years were perhaps dokras or bags:—

Average of former exports.

Export of Cotton from the Central Provinces during the under-mentioned years.

	Bales.	
1861-62	36,250	Included imported cotton, and was calculated in a much smaller class of bale.
1862-63	58,750	
1863-64	78,750	
1864-65	68,123	
1865-66	73,120	
1866-67	53,000	
1867-68	35,000	
1868-69	54,000	

34. The native manufactures of fine cloth in this part of the Central Provinces are, considering the damaging effect of a year of severe scarcity, still in a flourishing condition. There is a good demand for the beautiful fabrics of Nagpore, Oomrair, and Pohnee, and the cloth is so valuable that it is constantly sent in considerable quantities by passenger train to meet some sudden demand or brisk market; and on my journeys I have constantly found the break-van containing several well-packed bales of fine dhotees and sarees. The coarse cloth trade also is thriving, though all trade suffered, more or less, from last year's drought: and this will be noticed in both the exports of native cloth and in the imports of European piece goods. The exports of native cloth do not, however, I believe, give a correct idea of the immense quantities of cloth supplied by our looms to the Berar people. For, as I explained on a former occasion, a Berar Koonbee, if he wants a pair of dhotees for himself, and a bright-coloured saree for his wife, attends one of the fairs on the left bank of the Wurdah, and carries his purchases off with him under his arm. These purchases, which in the aggregate amount to something very large, do not appear in the export returns, which only include the packages sent to large traders. The fine Nagpore cloths go chiefly to Oomraotee, Sheagaon, Nassick, Bombay, Poona, and Hyderabad. All the better classes of Mahrattas wear them.*

State of the native cloth trade.

---

* The statistics now show that in the Nagpore country there are 55,629 looms at work, employing 111,699 workpeople.

35. The exports of native cloth, and the imports of European piece goods for the past few years, are given below:—

Return showing the quantity of Country Cloth exported from, and European Piece Goods imported into, the Central Provinces from 1863-64 *to* 1868-69.

Year.	Country Cloth exported.	European Piece Goods imported.
	Maunds.	Maunds.
1863-64	75,362	22,591
1864-65	54,277	58,496
1865-66	55,052	29,070
1866-67	52,893	58,402
1867-68	61,582	54,656
1868-69	40,118	49,585

The piece goods trade.

Besides the figures given above for 1868-69 of the European piece goods imported into our Provinces, 46,000 maunds pass through our territory *en route* to Central India, taking chiefly the line through Nimar to Khundwah, and these I have not included in my totals.

II.—Exports from the Berars.

36. The exports from the Berars are not liable to be affected in the manner which sometimes leaves its trace on the supplies from the Central Provinces. If I have sufficiently explained myself, it will be understood that the Berars grow cotton entirely for export. The richly cultivated Poornah Valley harbours no swarms of spinners, who, carrying off the raw cotton in small quantities, and working it into yarn and cloth, by degrees make a considerable hole in the out-turn. The well-to-do Koonbee of the Berars looks to Bombay, and to the looms of Nagpore and Oomrair, for his supplies of cloth. Looms are to be found in the Poornah Valley, it is true, but the yarn used is nearly all of Bombay or Lancashire manufacture, and the home-made cloths affect not at all the supply of the raw material which Europe confidently expects from the Berars.

Small proportion of the Berar crop retained for local consumption.

37. The exports from the Poornah Valley during the two seasons preceding that to which this report refers, are shown below. This year's figures are, I am inclined to believe, quite up to the average of former supplies, even of those sent during the most exciting period of the cotton famine, and reliable figures of which are not procurable:—

Exports from the Berars.

	Bales.
1866-67.....	218,000
1867-68.....	207,000
1868-69.....	233,000

In the above calculation I have credited the Berars with the excess 1,000 bales of Berar cotton carted across to the Hingunghat and other markets, and which has been deducted from the exports of the Central Provinces. The trade of the two Provinces is indeed dove-tailed so firmly together, that the figures do not admit of being easily separated, and it will now be convenient to consider them together.

38. The figures given below show the exports during the past three seasons from both Provinces towards Bombay:—

Year.	Central Provinces.	The Berars.	Total Bales.
1866-67	53,000	218,000	271,000
1867-68	23,500	207,000	230,500
1868-69	42,000	233,000	275,000

Exports from the Central Provinces and the Berars considered together.

This quantity of cotton went down in the form and by the means shown below:—

	Full-pressed Bales.	Half-pressed Bales.	Dokras.
By Railway	70,501	177,775	70,000
By Road	....	....	13,270
Total....	70,501	177,775	83,270

39. This has been reduced into bales of 400 lbs. each by a calculation based on the average weight of the various packages sent down by Railway in the form of full-pressed, half-pressed, and dokra bales. The up-country full-pressed bale, as is well known, generally contains rather less cotton than the half kandy, but this season the presses at Khangaon have succeeded in turning out large quantities of bales, each containing $3\frac{1}{2}$ cwt. of cotton nett; and in making the calculation, these bales have been allowed the full rank of Bombay "half kandies." This may be rather above the mark, but any excess is perhaps more than counterbalanced by the estimate of the half-pressed cotton. Last season the presses in use were of the small "Hassard" pattern, and in working out the figures of the exports three half-pressed bales were taken to the kandy. This year, native traders have introduced into the Berars a considerable number of half-presses, which turn out bales weighing as much as 5 cwt. The smaller presses are, however, still in use, and in striking an average the 177,775 half-pressed bales may not unfairly be taken to represent a like number of Bombay bales of half a kandy each. Some of my friends, who have been consulted on the subject, consider that this estimate is, if anything, below the mark; and if this view be correct, then the allowance above made in favour of the full-pressed bale will balance the calculation. As usual, three dokras have been taken to the bale, or six to the kandy.

Manner in which the calculation has been made.

The Exports then stand thus:—

Full-pressed bales		70,181
Half-pressed bales		177,775
Dokras	$\frac{83,270}{3}$	= 27,756
Bales...		275,712

V.

Diagram Showing
the Rise and Fall in
the Price of FAIR DHOLLERA from
the Year 1861 to 1869.

V.

Diagram Showing
the Rise and Fall in
the Price of FAIR DHOLLERA from
the Year 1861 to 1869.

It may, perhaps, be thought that instead of the above calculation, which cannot pretend to perfect accuracy, a more satisfactory estimate might have been framed by taking the gross weight shown in the Railway returns, and making a certain allowance for tare. But as at many of the stations, cotton pays at the "waggon" rate,* the figures, although they show the number of maunds paid for, do not accurately represent the quantity of cotton exported. On the other hand, for obvious reasons, the number of bales loaded on the waggons is entered with perfect accuracy, and the totals can be thoroughly trusted in the above estimate, which will, I believe, for all practical purposes, be considered sufficiently correct.

The chief cotton stations.

40. The degree in which the several Railway stations on the line help to make up the grand total of our exports will be seen from the following Statement **G**, in which the season's traffic is given in detail. The large exports from Budnaira (at present the station for Oomraotee) include much of the cotton of the Wurdah District carted across the borders, as already explained.

High prices ruling during the season.

41. The prices throughout the season have been remarkably high, as the annexed diagram will show, and they have not been without their effect on the exports. Nearly all the cotton that was to be got at in the Berars was, I believe, brought to market, and the quantity held back for better prices, or retained for home consumption, must have been extremely small. The increased exports may also be accounted for, in part, by the favourable name which our markets have now obtained, and by the large quantities attracted thither of cotton grown outside the boundary of our Provinces. At Khangaon, Akola, Oomraotee, and Hingunghat, the buyers, European and native, at these

Large proportion of the crop exported.

* When cotton is badly packed, as, for instance, in the case of many of the so-called half-pressed bales, a waggon rate is charged. That is to say, it is held that the cotton should be packed in such a manner as to admit of 5 tons weight being loaded on to a waggon. If this cannot be done, then the waggon-load of cotton, whatever its weight may be, is charged for as 5 tons, and 5 tons weight is entered in the Railway returns, which show the receipts on freight. Thus a station may show in its return 5 tons of cotton exported, when the actual weight of cotton sent down and available for the Bombay market was about 3 tons. The returns are valuable for the purposes of account, for which they are, I believe, primarily intended; but, as will be seen, they are not so useful in assisting us to form an estimate of the cotton available for export as the entries which give the number of packages of cotton carried by Railway.

G.

Statement showing in detail the quantity of Cotton exported from the Stations of the G. I. P. Railway in the Central Provinces and Berars during the Season 1868-69.

[Central Provinces Stations are given in Italic].

	Full-pressed.	Half-pressed.	Dokras.
Nagpore	....	....	680
Sindee	....*	....	296
Wurdah	4,224	17,409	1,095
Poolgaon	....	8,759	1,536
Chandoor	....	4,379	654
Budnaira	23,384	37,608	883
Moortizapoor	....	13,980	1,483
Akola	....	4,804	2,237
Sheagaon	14,772	50,860	3,921
Nandoorah	27,801	39,976	17,554
Mulkapoor	....	....	4,261
Boorhanpore *Khundwah*	....	....	35,400
Total	70,181	177,775	70,000

* Does not include 500 full-pressed bales sent to the North-West Provinces.

H. RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

no-longer-inaccessible markets, have very greatly increased during the last two or three years; the competition among the Agents is very brisk; and the ryots, naturally enough, favour markets where competition ensures for them not only a high price, but an immediate sale. Moreover, as "Oomraotee" is one of the best brands of Indian cotton, both the cotton grower, and the dealer who purchase consignments in the interior, have a great inducement to bring the produce to the Berar markets, and to get it passed down as part of the Oomraotee crop, rather than cart it across to a nearer, but less favourably-known, market far outside our boundary. And hence it is that considerable quantities of cotton, all of a good quality, but which, nevertheless, cannot claim to be the produce of the Central Provinces or the Berars, are now brought to our markets, and these help to swell the export returns. The cotton-growing tracts of the Nizam's country, lying between the angle, the apex of which is at Callian, and the sides of which are formed by the Nagpore and Sholapore Lines of the G. I. P. Railway Company, for the reasons given above, naturally enough favour the Nagpore branch; and this season I have seen cotton brought into Khangaon and Sheagaon which had been brought from hundreds of miles south, in order to try and pass under the good name of our favoured market.

Cotton brought to our markets from without our boundary.

42. Nor have the Bombay supplies been affected this year by a steady drain of our cotton towards the North-West Provinces and Bengal, as was the case last season. With the exception of some 500 bales despatched from the Sindee station, I have not heard of any of the cotton grown to the south-west of Nagpore having been cut off from the Bombay market. Still, even if the increased supplies are to some extent correctly accounted for as above, both the crop and the exports of these Provinces have this season been large, and the result is satisfactory, as showing that the liberal price paid for cotton has not been without its effect on the cultivators.

The whole crop secured by the Bombay trade.

43. I am also able to add, which cannot fail to be a matter of interest to the trade, the statistics of the imports of native cloth and European piece goods into the Berars. The figures given below are from the Administration Report of the Resident for 1867-68, and show the trade for that year. Under piece goods is included the European yarn used in the local manufactures, as the Railway authorities show the bales in

Berar cloth trade.

which the piece goods and yarn are packed under the same heading in their returns:—

Imports of Native Cloth and European Piece Goods into the Berars during the Year 1867-68.

	Native Cloth, Maunds.	European Piece Goods, Maunds.
East Berar.....	9,429	451
West Berar.....	1,747	5,637

There is the most remarkable difference in the proportion of the European and native cloths used in these neighbouring divisions, which I am hardly prepared to account for at present, although inquiries have been made on the subject. It may be that West Berar, being near to Bombay, has really adopted English cloth to the almost entire exlcusion of the native article, and that East Berar still depends chiefly on the Nagpore looms for its supplies. Or it may be that much has been entered in the West Berar return as piece goods which is really native cloth; for I may mention that I find that all the better classes of native cloth packed in bales, and not tied up in bundles, sent away from Nagpore, was, until recently, entered in the Railway returns, from which these statistics are framed as "piece goods." Or there is a further and, perhaps, the correct explanation, that all the English piece goods for East Berar come from Bombay through West Berar, and is booked there in the returns; the same process being observed, *en revanche*, by East Berar in the matter of native cloth from Bombay here.

SECTION IV.

MEASURES ADOPTED TO IMPROVE THE CULTIVATION OF COTTON.

I.—By the selection of Indigenous Seed.

44. Following the order observed in my last Report, I have now to notice briefly the measures that have been adopted during the past season to improve the cultivation of cotton.

45. It will be remembered that the great question that presented itself for solution, when I had last the honour of reporting on the operations of this Department, was the comparative merits of the exotic and indigenous seed as the cotton crop to be adopted for these Provinces. Up to the date of my last report, the question of the adaptability to the climate and soil of Central India of the American plant had not been authoritatively decided; and in the hope of securing for our Provinces an improved staple, it was determined, notwithstanding the many previous and discouraging failures, to give the foreigner yet another trial, and to arrange for experiments being made on such a comprehensive scale as to ensure every hope of conclusive results. As it was quite evident that, whilst these experiments with exotic seed were being conducted, much might be done to improve the indigenous plant, it was further determined that attention should be paid to the selection of the seed of the indigenous cotton on the plan so usefully advocated by Major Trevor Clarke and Colonel Showers.

Position of the question at the date of the last report.

46. During the former season I had myself chosen one of the most promising looking cotton fields in the neighbourhood of Hingunghat, and had selected, on the pedigree-system, a considerable number of the finest "bolls" for future sowings; and, on my being obliged to leave the district, this process was carefully continued by a gentleman who thoroughly understood the system. The seed, thus selected, was sown soon after the first fall of rain in a very favoured tract, and the crop so raised, when it came to maturity, was again subjected to inspection and to "the rogueing" and selection pursued by seed-gardeners at home. The season was not a particularly favourable one, but a considerable crop was raised, which has been resown, and will again be re-subjected to Major Trevor Clarke's

Seed selected last season.

processes in the seed-farms established this season in East Berar, West Berar, and the Wurdah Valley, of which a detailed account will be found in a later paragraph.

47. Arrangements were also made for selecting seed from some of the finest cotton fields in the Poornah Valley. A very rich field, bearing a splendid crop, was fixed upon during a morning's ride, and the finest bolls of the healthiest plants growing in the richest quarter of the field were selected, and put carefully aside for this season's sowings. By this process, not only was a stock of superior seed secured, but a practical lesson was taught to the villagers, who were somewhat surprised to see "*sahebs*" turned cotton-pickers. Some who watched us promised to adopt the system on their own account, and all again readily admitted that, after all, this was only what was done in the case of their *jowaree* (millet, their grain crop); for the largest "*Bhūtas*," or heads of grain, were always singled out and put aside for next year's sowings. "A Koonbee farmer could do this himself, and easily," they said. "It took no great time to pitch upon the finest heads of *jowaree*: the crows and jowaree birds could do that, and rather too well perhaps. But as for cotton—why, the picking of the *kuppas* (cotton in the seed) was a different process altogether, it was much more difficult to get at the best 'bolls.' Women picked the cotton by contract, and got paid by the amount they picked, and took the first cotton that came to hand. Every one was in a hurry to get the crop in, and there was no time to grub about for the best bolls. And, yes, perhaps, too, the fact of their grandfathers never having resorted to the plan had something to do with it not finding favour in their eyes, for their grandfathers were good cultivators. But they (the speakers) would take superior seed fast enough, if they could get it cheap. It must not, however, be the '*Walayatee*' (foreign) stuff. By the favour of the *saheb*, no doubt the strange seed could grow; but then *they* were only poor Koonbees and did not know how to manage it, and the *saheb* would not always be near the village to advise and help them. Ram Rao had tried some '*Walayatee*' cotton two years before, and it had been a dead failure, but if the *saheb* next year would raise some good seed of their own sort they would gladly buy it. They knew well enough they would get from him *quite as good* weight as from the Mahajun, or village banker, no fear of that." And this sketch of a conversation which I had last year with a group of cultivators, and which has been repeated over and over again in different parts of the cotton-

Seed selected in the Poornah Valley.

Opinion of the Berar cultivators on the subject.

growing districts, is inserted here as showing, I think, that if we want improvement, we must not in the first instance depend on the natives themselves for it. We must clearly demonstrate to them the advantage of our system, and then, perhaps, they will follow. I have but little doubt that, by degrees, they will readily purchase the superior seed which is now being raised in our model farms, and that a considerable improvement in the cotton cultivation will result therefrom.

Moral to be drawn therefrom.

48. Holding these views, I advocated very strongly the establishment this season, at selected places in the cotton districts, of Seed Farms. The quantity of seed selected under my own supervision had so increased, that it became necessary that the experiments, if they were to be continued at all, should now be undertaken on a much larger scale, and on a system which the Cotton Commissioner could not superintend single-handed. His Excellency The Vice-Roy and Governor General in Council was pleased to sanction, on the recommendation of the Chief Commissioner, and the Resident, the establishment of three seed-farms in the Central Provinces and the Berars, situated respectively in the Wurdah Valley near Hingunghat, near Oomraotee in East Berar, and near the railway station of Sheagaon in West Berar. To the charge of each of these farms a special officer has been appointed, who, during the slack season from June to December, when the crop is growing, will see to the cultivation and selection of the seed on the pedigree-system, and will assist generally in all matters connected with experiments for the improvement of our cotton supply. When the crop is off the ground, these gentlemen will be employed as Inspectors under the Cotton Frauds' Act, and will act generally as Assistants to the Cotton Commissioner in all branches of his department. As I regard the establishment of these farms, under competent management, to be the most important step that has as yet been taken towards improving the cotton of this part of India, I have purposely given the subject prominence here, and accorded it the first place in this section of the Report.

Establishment of Seed Farms.

And appointment of special assistants.

Importance of the subject.

49. Some little difficulty was at first experienced in selecting sites for the farms. The best cotton-growing tracts that could possibly be found were, of course, the most likely to yield the best crops, and hence the best seed.

Selection of sites for farms.

But, to ensure the success of the experiments, it was indispensable that the fields should be easily accessible, so that the Assistant in charge of the farm should be able to have the whole area under his eye, and to visit the fields constantly, and superintend personally each single agricultural process. This condition necessitated the location of the farms in the neighbourhood of some station where house-room was available, and to some small extent limited my field of selection. For the scheme was sanctioned so late in the season, that, even had it been considered desirable to incur the expense, there would have been no time to run up even temporary houses for the Assistants in charge of the farms, and for them to pass the rainy season in Berar under canvas was quite out of the question. But, in reality, this circumstance will in no degree affect the success of our experiments; for, inasmuch as the town of Hingunghat is in the very centre of the best cotton-growing tract in India, no great difficulty was experienced in finding close to the station some fields well adapted for our purpose. And as at Hingunghat, so also at Oomraotee and Sheagaon, which are situated respectively in the best cotton-growing tracts of East and West Berar. Should it be determined to continue these experiments on an extended scale next season, it may be necessary to change the sites, and, perhaps, to build a house for the officer in charge of the farm, who, to be of real use, must be close to his work. But it must not be forgotten, that it is particularly desirable that the seed-farm should be near the great cotton markets, so that the thousands of Koonbees who bring in their cotton, may, on their return, have opportunities of visiting the farms, being convinced of our improvements, purchasing their supplies of seed there, and carrying it off home on their empty carts: and these considerations were all allowed some weight in selecting the sites for the farms.

Reasons that guided the selection.

50. The seed-farm in the Wurdah Valley is situated close to Hingunghat. Some of the fields are within the boundary of the village of Kôwerghat, which (having been employed in making the land revenue settlement of that tract) I know is famous for its good cotton land. The soil is rich, and well drained, sloping down towards the adjacent river, the Wunna. The extent of land actually taken up for this farm amounts to 52 acres: 46 acres of this has been sown with the best Hingunghat seed, and, taking a yield of 200 lbs. of selected seed to the acre, we should depend on nearly 10,000 lbs. of first-class seed for next year's sowings, or enough

The Hingunghat farms.

to sow 1,000 acres of cotton ground. These experiments will test the effect on our indigenous cotton of deep ploughing, manure, irrigation, and other well-known means, and a portion of the farm will be cultivated on the native principle, by way of contrast. In a separate part of the farm exotic seed will have yet another chance, and advantage has been taken of the presence of a European officer on the spot, whose exclusive attention will be devoted during the rainy season to these experiments, to sow Divi Divi, Virginia tobacco seed, and other produce, which, it is believed, may be with advantage introduced into this part of India. Mr. A. J. Dunlop, who during more than a year has proved himself a very efficient Assistant, and who, during my absence, superintended very carefully the experiments at Khangaon, has charge of the Hingunghat farm.

51. At Oomraotee, 98 acres, in a favourable position to the north-west of the town, in the village lands of Sooklee, have been selected for the seed-garden, where experiments, similar to those decided on for Hingunghat, have been commenced. The land is well drained, and, as it has been but little worked during the last few years, is admirably suited for our purpose. The farm is in charge of Mr. Nago Rao, a native of this part of the Berars, from whose experience of the country and the people I anticipate much assistance in dealing with the cultivators. He was well known to me in the Land Revenue Settlement Department, and his thorough acquaintance with all the details of the native agricultural systems and customs will be of value to this Department. At the Oomraotee farm, also, experiments with tobacco and other seeds will be undertaken on a small scale.

The Oomraotee farm.

52. The largest farm is near Sheagaon, in West Berar, the railway station for the great cotton market of Khangaon, from which place it is eleven miles distant. Here 112 acres of excellent cotton soil have been chosen. The position and other conditions are favourable, and, with a good season, I hope we may raise here enough selected seed to sow 2,000 acres of cotton land in the Berars, or, admitting the produce of the other two farms into the calculation, enough in all for nearly 5,000 acres of land. Here, besides experiments similar to those laid down for the other farms, a variety of cotton seeds selected for me by Major Trevor Clarke will be sown, and the effect of hybridising the various species will be carefully watched. Major Trevor Clarke's views on the subject, and the arrangements made for carrying out his wishes, will be found treated of at a later page. Mr. Theodore

The Sheagaon farm.

Kleinknecht, who was for some time a practical cotton farmer, and who has had more experience of cotton cultivation than almost any gentleman in India, very kindly consented, at my request, to take charge of these important experiments during the present season, and I confidently expect great success from his practical and intelligent labours. As a cotton-merchant, Mr. Kleinknecht has a great interest in the improvement of our cotton, and to his experience of cotton cultivation he unites a knowledge of this part of the country and the people,—elements which ought to command, if any thing can, successful results.*

53. The season, although it has been extremely capricious, promises to be favourable, and I am sanguine of the success of these measures. And the more experience I gain, and the more I hear on the subject from gentlemen who are well qualified to give an opinion, the more am I convinced that by a system of seed-farms, and by paying attention to the indigenous plant, which, even in its present state, bears no indifferent character, we have more prospect of improving the cotton produce of these Provinces, and of benefiting the trade, than by almost any other means that can be adopted. During the past year I have anxiously sought the opinion of many experienced gentlemen, in order to ascertain whether I was in any way justified in taking up a strong position in favour of the once-much-abused indigenous plant, and the result has been, that I am confirmed in my views, that, in Central India at least, we are not on the wrong scent, if we attempt, in order to raise the character of the produce, to supply the cultivators with good seed. On this subject Major Trevor Clarke's opinion is very valuable, and I would quote here extracts from letters with which he has favoured me, and which bear directly on these points.

Opinions of authorities in Europe on the merits of this scheme.

54. Major Trevor Clarke, who has the best claims to be considered an authority on the subject, writes to me as follows; and this and other extracts from his letters are entered here, as I am confident they will be read with interest by all who are inclined to pay any attention to the improvement of Indian cotton:—

> "I have a strong conviction of the great improvability of the Asiatic plant, and to an extent not dreamed of by those who have not been initiated in select seed-growing *done well.*"

---

* Since the above was written Mr. Kleinknecht has, to my great regret, resigned his appointment in the Department in consequence of his salary having been reduced.

55. Again, writing in May last, he said :—

"I thank you much for your kind offer of Indian native cotton seed. I am now taking the Indian race in hand, having worked hard at the occidental (American) breed for some years. I think after all we shall have to look to the improvement of the true Asiatic cotton (Goss. Herbaceum (Linnæi) Indicum (Royle) to be of real good in India."

* * * * * * *

"I think it probable that the Hingunghat plant would keep its character in Bengal or any where else under high and careful cultivation—I mean the 'Scotch-farmer'-sort-of-cultivation, doggedly good, and defiant of climatic or any other difficulty. I do not think deep cultivation ever disagreed with any plants yet, provided they were not too crowded in the rows. Witness dibbled wheat, turnips, mangel-wurzel, &c.; planted thick in rich deep ground, these plants would run to leaf rather than bulbs, and so I think will cotton. With thin planting I should be inclined to *select* a robust race as a trial ; give *room*, light, and air, and let him do his worst. Free air *makes* fertility. Please take these last observations as suggestive, and not by way of *dogmatization*."

* * * * * * *

"Finally, I have a strong belief in the application of real good independent farming on Indian soil. It has only yet been partially tried, but always with appreciable good results.

"Banish from your mind the idea of getting good crops *every* year. We cannot do it in Norfolk with turnips; in the Lothians with grain; in Devonshire with cider; or anywhere with beans, hops, plums, peaches, or any thing else; besides it would spoil the market for the producer!!

Extracts from Major Trevor Clarke's letters.

"I have fruited plants from several pods of Hingunghat cotton sent me by Ashburner. Each specimen reproduces the size and quality of staple of the individual pod from which the seed was taken. Small size and inferior quality are, doubtless, in many instances, the result of bad seasons, late ripened pods, and so on; but I am convinced of the great tendency to hereditary transmission of permanent character in individual plants. I am also thoroughly convinced of the possibility of selecting and growing a breed of Indian cotton with staple as long and as good as any

New Orleans that ever was grown in Dharwar. The plants selected for examination should be pulled up by the roots bodily when the bolls are ripe, and every boll on each plant examined (as a study); the earliest ripened and best pods, of course, being selected for sowing.

"The true characteristics of Hingunghat or other desired sort should be studied during growth, to enable the operator to weed out what he has learned to be any other and inferior race. I have no doubt that mixture of races exist, even in the best stocks, let alone variations of the true race, and that these are of no modern origin, but may have been multiplying themselves since the time of the Institutes of Menû, and even earlier."

56. These and other valuable suggestions made by Major Trevor Clarke for the improvement of our seed produce will receive every attention, and the subject will be carefully studied at the seed-gardens. Perhaps the point which, on looking back, strikes me more forcibly than any other, is, how it happened that the importance of seed farming and supplying the natives with good cotton seed, (seeing that they would not trouble themselves much on the subject,) was not brought out into stronger relief before. Until I joined my present appointment, I had not many opportunities of studying the question. But I have now fully realized that the system of raising on the best land crops exclusively for seed is recognized in every country in which any attention is paid to agricultural success; and that this is the case in America in respect of cotton seed, the subjoined letter, which I have extracted from one of the latest numbers of the *Southern Planter*, one of the leading agricultural papers in the chief cotton-growing tract of the United States, abundantly proves:—

Attention paid to seed farming in other countries.

Extract from Mr. David Dickson's (of Georgia) letter to the "Southern Cultivator."

"I went into the business of selling cotton seed unwillingly, but it has paid me very well, and will pay purchasers better, if they will manage properly. I will give my views as to the best manner of keeping the seed pure and improving it. There is a belt of land running through Georgia and other cotton States that I consider the home of the cotton plant; possibly the bottoms in the

West may be better adapted to it. The southern line commences in Georgia above Augusta, and ends just above Columbus, embracing the southern granitic region, mulatto, pine, and oak, and hickory lands, and extending above one degree north. I prefer the southern part of this belt. The north end of my farm is included in this southern part. I have sold no seed made on the southern part of my farm, it being too sandy to keep the seed up to the desired standard. *Planters living south of this line would do well to obtain seed from this region once in three or four years.** If that trade should spring up, seed could be delivered, sacked, to the nearest depôt at 50 to 60 cents. per bushel; south of this belt the cotton plant is inclined to produce too much seed and too little fruit. In it, with proper preparation, rotation, manure, and rest, you can make the cotton plant just what you please, as gentlemen from all parts of Georgia can testify, who have seen my crop making two bales per acre on cotton from 26 to 28 inches high.

Opinion of Mr. David Dickson, of Georgia.

"*To improve the cotton plant, you should select seed every year immediately after the first picking up to the middle of October, selecting (in the case of Dickson's seed) from stalks that send out one or more suckers near the ground, sometimes called arms.* * These arms need not be looked for on poor land. Secondly, from those that send out limbs thick with three to six bolls from a half inch to one and a half inches apart on the limbs. If you do not keep your land well charged with humus, the cotton limbs will be too short. Manure well, plough deep, cultivate with the sweep very shallow; scrape with the hoe instead of digging or chopping. If you cut the cotton roots, you will make stalks instead of bolls. On all farms, there are some acres that produce cotton better than others. *Seed for planting should always be selected from these spots.*"*

* * * * * * *

"To those who wish to know my opinion about the various manures, I refer them to what I have often said in the *Southern Cultivator*. I will merely mention that I consider ammonia the 1st, soluble bone the 2nd best, salt and plaster a good preventative of rust in cotton, besides possessing other good properties." * *.

57. The attention now paid to the subject is further testified to in the subjoined further extract from a letter recently published in the *New York Times*:—

* The Italics are mine.

"With the new methods adopted by the planters in the growth of cotton, I was particularly impressed. Before the war, when land and negroes were plentiful, the planters seemed to have little concern about the amount of land cultivated, or the amount of labour expended in producing the great staple. If at the end of the year's operations they had enough cotton to clear them of all expenses and give them enough to begin another season's labours they were quite well satisfied. The increase of their slaves made their estates. The cultivation of their land was really of secondary consideration. Thereby they kept their slaves in clothing and food, and their families in comfort, and with this their care for business ended. To-day labour is scarce and costs actual cash, and their wits are now for the first time taxed to make the most of it. They now exchange samples of cotton one with another, and compare the costs of production per hand. In travelling to-day on the cars you hear them discussing the merits of fertilizers, of sub-soil ploughs, and of the best means of saving and gathering the seed. Country meetings are held, something similar to the long-adopted agricultural fairs of other States, and the whole subject of cotton culture is discussed and the results of new experiments reported. As an evidence of these innovations, I was told that there is more guano now shipping over Southern railroads than there ever was in any half-dozen years before. Every depôt receives its stores of it, and every planter buys his share. Improved ploughs are finding their way on the farms, and deeper ploughing is the result. Very few of the planters owning large farms will now pretend to cultivate all they own. They farm fewer acres, but farm these few thoroughly. They raise now on their own lands their own corn, wheat, oats, potatoes, &c. One of the results of this new era is the experiments in caring for the seed. Before the war, cotton seed was gathered with the cotton, and most of it was sold at low rates, say at twenty-five cents. per bushel, and very much of it was given away. This past season a new phase was adopted generally, and is pronounced a success. *The seed-gatherers go on in advance of the pickers, and carefully pick out the largest and finest seeds. The yield from seeds thus produced is said to be at least twenty-five per cent. more than from seed gathered and preserved on the old plan. The seeds being larger and better preserved, the cotton is better, and sells for about fifteen per cent. more.** Cotton grow-

Recent improvements in the United States.

* The italics are mine.

ing is now the means by which planters must live and make their estates. It is therefore a business, and receives as much attention and thought as any other vocation."

58. The American plant doubtless requires somewhat different treatment from the indigenous cotton of Central India, and the instructions given by Mr. Dickson regarding the cultivation may not be altogether applicable to the circumstances of our Provinces. But his letter, and it is only one of many on the same subject, shows, I think, that even in the United States, with the excellent cotton for which that country is celebrated, the precaution of constantly renewing the seed, and purchasing it from the most favoured localities where the seed is carefully grown and selected, is not ignored; and if this is necessary in America, where the soil, comparatively speaking, is yet young, and has not been exhausted by a constant and prolonged cultivation of the same crop, how much more necessary must their precaution be in India? And if in this country the cultivators are not sufficiently alive to this cardinal feature of agriculture, and if private parties cannot be found with sufficient enterprise to rear superior seed, surely it is within the province of the Government Cotton Department to take the matter in hand; to impress the importance of the measure upon the people; and, when the advantage of the system has been sufficiently realised, to supply them with good seed, specially grown for the purpose? I am confident that any one who peruses the extracts from the preceding letter, will feel convinced that Government has not acted unwisely in establishing a system of seed-gardens in the manner above noticed for the improvement of the indigenous seed.

Necessity of the matter being taken in hand by Government.

59. On this important subject I have received many letters from private friends, which it is unnecessary to quote here, all of whom recognise that this selection and cultivation of seed is of the first importance, and that on it the improvement of the indigenous cotton mainly depends. That this indigenous cotton, even in its present, almost-uncared-for state, is not altogether devoid of merit, has been established by extracts from the opinions of the best authorities quoted in last year's report. Throughout this season our crop has sustained its high character: indeed, I may say that all the cotton of this side of India has found favour in the home market, as the annexed extract from one of the most recent Liverpool circulars will testify:—

Prices obtained by our cotton as compared with American cotton.

"We quote *Middling Bowed*, 14½*d.*; *Mobile*, 12½*d.*; *Orleans*, 12¾*d.*"

* * * * * * *

"EAST INDIA.—*McCartney-ginned Broach** of good quality is very scarce, and parcels equal to the early arrivals would bring extreme prices. The best offering is selling at 11½*d.* per lb., but the supply is very poor. *Oomraotee* of the new crop commands good rates, 11*d.* per lb. has been paid for clean good staple cotton.

"*Hingunghat* is in demand at fully ¼*d.* per lb. advance. One parcel sold on the 1st instant at 12*d.* per lb.; this lot was by sailing vessel and of similar quality to the early overland cotton. The best offering in the market now sells at 11¾*d.* per lb. *Verawul* has been in fair demand, and prices are ⅛*d.* per lb. dearer. *Comptah* has been in good demand for all descriptions, and prices are fully ⅜*d.* per lb. dearer. The better qualities are very scarce. *Saw-ginned Dharwar* has again been in active request, and the supply being very moderate prices have advanced ½*d.* per lb. New crop cotton is ¼*d.* per lb. dearer, good parcels being worth 11¼*d.* per lb. The quality of this is greatly approved on account of its cleanliness and good colour. *Madras* is in very fair demand, and scarce at about ¼*d.* per lb. advance. *Rangoon* is in demand at previous rates, but the market is bare of supplies. *Bengals* are in good demand, prices are about ¼*d.* per lb. dearer. The new crop has proved very irregular in quality, some parcels being much mixed and seedy. *Scinde* is very scarce, and quotations are raised ¼*d.* and ½*d.* per lb. A large business has been done in cotton to arrive, and prices are ¼*d.* per lb. higher.

"*Sales of East India* from 24th June to 7th July (inclusive) 65,000 bales, of which the trade have taken 45,000 bales, speculators 6,000, and exporters 14,000 bales.

Quotations.

Descriptions.	Broach.	Dhollera.	Oomraotee.	Hingunghat.	Verawul.	Comptah.	Saw ginned.
Middling.....	8⅞ to 9	9	9⅛	..	8⅜	8⅝	..
Middling-Fair	9½	9⅝	9⅝ to 9¾	10⅝	9	8⅞ to 9	9⅞
Fair	10⅛	10⅛ to 10¼	10⅜	11	9⅝	9½	10⅜ to 10½
Good-Fair to Good	10½ to 11½	10½ to 10¾	10⅝ to 11	11½ to 11¾	9¾ to 9⅞	9⅝ to 9⅞	10¾ to 11½

* The italics are mine.

	Tinnevelly.	Western.	China.	Rangoon.	Bengal.	Scinde.
Middling-Fair	..	9	..	..	8¼	8½
Fair	10	9½	..	8½	8⅝	9
Good-Fair to Good	10¼ to 10½	9⅝ to 9⅞	..	9 to 9¼	8¾ to 9⅛	9¼ to 9½

"Stock of East India (1869) 19,000 bales against (1868) 28,000 bales. Total stock (1869) 337,000 against (1868) 565,000 bales. Market to-day 10,000 bales sold, 2,000 speculation, and export 4,000, East India closing steady."

Here it will be seen that Hingunghat, even when new Saw-ginned Dharwar cotton was in the market, topped the list, selling for 12*d.* a pound when New Orleans was at 12¾*d.*, or only ¾*d.*, or not 6 per cent. higher than Hingunghat; Oomraotee at the same time commanded 11*d.*

60. The above paragraphs will show the steps that have already been taken to raise the character of our indigenous produce. Much yet remains to be done; and as the close of this chapter will show, we are not without schemes for the future plans for irrigating and manuring the plants, and improving both the quantity and out-turn of the crop. But as these hardly come under the heading of the measures adopted during the season that has just closed, it will now be necessary to consider the position in which the experiments with exotic cotton now stand.

II.—By the introduction of Exotic Seed.

61. During the past season I have steadily acted up to the determination, expressed in my former report, of giving exotic seed a fair chance, and of testing still further by experiment whether the foreign plant is ever likely to be a success in the peculiar climate of Central India.

Experiments with exotic seed.

62. The trials with American seed,—procured for me through the kindness of Mr. Kittredge, the Consul of the United States at Bombay,—and of Dharwar acclimatized seed supplied by the Cotton Depart-

ment, Bombay, were conducted with the greatest care at Khangaon this season under my own superintendence, and the results were watched by me with considerable anxiety.

By Mr. Assistant Commissioner Byramjee Jamsetjee at Akola.

63. At Akola also, Mr. Assistant Commissioner Byramjee Jamsetjee, who has had considerable experience in cotton farming, and who is particularly well qualified to conduct experiments, was good enough to try the American seed, with results which can best be described in his own words, extracted from his report, with a copy of which he has obligingly furnished me:—

"The New Orleans seed takes the last rank as regards the quantity of produce, and it would not, therefore, be out of place to state here that endeavours to grow it in the country will not, in my opinion, ever be attended with success. Before beginning to flower, the plant seems to all appearance healthy and promising, but soon after that it sheds its leaves and appears to wither away. This was the case with it this year. It is true that there was not a sufficient fall of rain during the season, yet there was nothing in the weather to injure the indigenous cotton plants (as is sometimes the case).

"The New Orleans plant, however, gradually thinned away, and did not at all fulfil the expectations formed of its produce. It is probable that the climate of this country is not congenial to its growth. I am led to arrive at this conclusion, not from the experience of one year, but from that of 15 years (from 1855). I was at Booldana in that year (1855), and had the New Orleans seed sown in two places, one near the tank, and the other in the garden attached to my house. The plants near the tank did not thin or wither away, but were healthy and sound until the last picking of cotton was completed. The plants in the garden were also healthy, but produced only $\frac{1}{3}$rd of the quantity obtained from the plants near the tank. This conclusively shows that this seed requires a cool climate and good soft soil: and such a climate and soil it is very difficult to find in Berar. The tract bordering the Poornah, and places adjoining the ranges of hills, contain water near the surface, but the soil is not generally fitted to grow this cotton successfully."

64. Mr. Byramjee then goes on to express an opinion, which, I believe, is perfectly correct, that the quality of cotton grown near large rivers, where moisture is abundant, is generally the best. He says:—

"The cotton grown in places within three or four '*coss*' from the banks of large rivers, or in places where water is comparatively near the surface, produces a good crop, and staple is of great length. One of the reasons for expecting a good crop in such places is, that heat causes cracks in the soil, and the air, by rushing in and out the cracks, keeps the soil cool.

"The Dhollera, Hingunghat, Akote, and Dharwar cottons have of late attracted much attention. The cotton grown at Bagulkote in Dharwar, that at Bordee and on the borders of the Poornah in Berar, and in the Hingunghat District, are the best of their kind; and from the positions of these places, I am led to believe that large rivers have a great deal to do with growth of good cotton. Bagulkote is situated between two large rivers, the Mulperubha and the Ghatperubha, and the river Kristna is near at hand. The village of Bordee, in Akote Talooq in Berar, is also situated on a river. The Hingunghat District borders the river Wurdah. The Churotin Pergunnah, which lies between the rivers Maher and Saburmuttee, produces cotton commonly known by the name of Dhollera cotton. The cotton grown at the places in question is not equalled by the cotton (although of a good kind) produced at places in the neighbourhood and at a distance from the water."

His opinion regarding exotic seed.

65. I am not quite sure that the reasons for the superiority given by him are correct, and am inclined to think that it is to be traced to the moisture in the atmosphere alluded to in the preceding paragraph. But the following remarks on the subject of selecting the seed are of interest. Mr. Byramjee continues:—

"The cause of the superiority of the cotton is, I think, that, besides the good supply of water, the people there take a great deal of care in selecting and preserving seed for the next year for sowing. The pods, which are very healthy, and seem to contain much cotton, are cautiously chosen out, and the seed obtained from them is carefully preserved for the next year's sowings. If the same system be observed in Berar, I am of opinion the quantity and quality of cotton grown here would greatly increase, and that thereby it would be needless to introduce seed from other countries. Persons in America, I am told, who are employed to pick cotton, are always provided each with three bags, in which the collected cotton is put,

according to its quality. In Berar the picking is carried on so indiscriminately, without any regard to cleanliness of cotton or otherwise, that the good and bad cotton is put together, whereby its intrinsic value is greatly lowered. The ryots do not commence to pick cotton as soon as the capsules begin to burst one by one, but wait till all the capsules have burst, whereby the cotton from pods that open first falls down and dirt is mixed with it. Besides this, the ryot do not employ daily-paid labourers to collect cotton, but a contract is given; and the object of the contractors being to complete the picking within as short a time as possible, they do not take sufficient care, whereby foreign matters mix with the pure cotton and lessen its value. But I am glad to state that as the people have now begun to appreciate fine cotton, as they are repeatedly advised and instructed on the subject, and as they see the care bestowed upon the growing of cotton under the supervision of Government officials, they will soon follow the good example, and will gradually increase the value and importance of Berar cotton."

On the selection of seed.

66. The plants at Khangaon came to maturity during my absence; and Mr. Dunlop, my Assistant, who remained in charge of the experiments, has thus described the results:—

Experiments at Khangaon.

"For the first six weeks the American plants were the most promising of all, but about the middle of September they began to droop, and the Dharwar acclimatized was the first to show unmistakeable signs of failing.

Mr. Dunlop's report.

"The flowers half opened, withered, and dropped off; the leaves followed; and by the end of the month the plants were to all purposes dead. In some shady corners they withstood the heat, but fully 75 per cent. of them were blighted, and the yield from this field, measuring 1¼ acres, was only 120 lbs. of kuppas, or 36 lbs. of clean cotton. The New Orleans was somewhat stronger than the Dharwar acclimatized and did not succumb so rapidly; but many plants bore no cotton at all, and the yield was not more than 44 lbs. of cotton to the acre. There is no doubt that a large portion of this cotton would have been saved had rain fallen in September; but in Berar, where the average rainfall is said to be 25 inches, we cannot be dependent for our supplies on a plant which requires

so much nourishment as the American, and I am strongly of opinion that it never will succeed in Central India."

The area sown with American seed was 3½ acres, with acclimatized Dharwar-New Orleans 1¼ acres, and the out-turn was 44 lbs. and 29 lbs. of clean cotton to the acre respectively. The result of two experiments with indigenous seed on the pedigree-system gave 90 lbs. and 125 lbs. of clean cotton to the acre, and this during a season in many respects unfavourable.

Opinion of the Chamber of Commerce on the produce.

67. The yield of the exotic plant was, it has been shown, extremely poor as to *quantity*. I now have to quote the verdict of the Committee of the Chamber of Commerce on the *quality* of the produce of the exotic seed:—

"No. 1.

"*Dharwar Acclimatized.*

"Good colour, fair length of staple, fine and silky, but deficient in strength. This cotton is much weaker than Hingunghat and the better kinds of Oomraotee.

"No. 2.

"*New Orleans.*

"Dull in colour, leaf dark, staple similar to No. 1, but more wasty and weaker.

"You will observe from the terms of the report on each sample, that, as regards the cotton grown from Dharwar acclimatized and from New Orleans seed, the reports are not of an encouraging character; and the Committee, after a careful examination of the samples, are of opinion that the weak and somewhat exhausted nature of the staple would only be more strikingly developed by further experiments with seed from the same varieties. It is the opinion of this Chamber, based on knowledge derived from the inspection of a very large number of samples, that no exotic variety that could be grown in the Berars will equal in value and usefulness the indigenous varieties of the country known as Oomraotee and Hingunghat; and the Committee are of opinion, that whatever can be done to maintain the present high character of

those varieties, or, if possible, to improve it, would be one of the most important services that can be rendered to the cause of improved cotton cultivation in the districts of country under the Cotton Commissioner's superintendence."

68. Messrs. Booth & Co., a firm of great experience in cotton matters, were good enough to give the following opinion on similar samples:—

Messrs. Booth & Co.'s opinion thereon.

"Thanks for letting us see your samples of New Orleans and Dharwar acclimatized cotton cultivated here.

"Both samples are very *weak* in staple, though, in point of fineness and appearance, they would class well. We prefer the acclimatized in every respect."

69. The result of this another year's experiments with exotic cotton may thus be summed up. Although the plants were treated with more care than they would be likely to receive if the cultivation became general, they succumbed to the climate—the yield was miserably small; the staple weak and far inferior to the indigenous cotton. It may fairly be urged that the season was an unfavourable one. But, in answer to this, it might be advanced that, notwithstanding the drought, the indigenous plant did not fail us, and that both in quantity and quality last year's crop was a good one. And, as the seasons are unfortunately somewhat given now-a-days to being capricious, it appears to be a question, whether it would be wise, even if the staple and out-turn of the exotic were superior to that of our "Hingunghat" and "Oomraotee" cotton—which the specimens grown in our Provinces have not yet proved themselves to be—whether it would be wise to be dependent for our cotton supply on this somewhat delicate stranger?

Results of the experiments considered.

70. At present I will not say more than that I am anxious that exotic cotton should have yet another trial; and the establishment of the Government seed-farms in three different localities, in charge of competent officers, will ensure to the further experiments the fullest advantages, and the result of the sowings will be noted at length in my next report. There is every desire to give the exotic plant the fairest of chances; and if it will only assert its superiority, I can promise that no exertions shall be spared to secure its extension. But it may not unfairly be said that, as yet, it has not given such an out-turn

Yet another trial will be given to the exotic seed.

as to justify me in commencing the long-advocated crusade against the native plant. In the meantime, the indigenous cotton will receive every attention; and I have only to add that, in regard to the exotic cotton, next to decided success I should like a really well-established failure, which might authoritatively decide the question of the introduction of the American plant, and enable us to concentrate all our energies on the improvement of the cotton indigenous to the country.

Experiments with hybrids.

71. Several gentlemen who have the best claim to be considered authorities on the subject, are of opinion that Indian cotton may be improved by hybridisation; and now that the Supreme Government have very liberally sanctioned seed-farms under competent management, I feel that every effort ought to be made to test the applicability of these views to the cotton of Central India. Major Trevor Clarke, to whose assistance and support I have had on several occasions to refer, has been good enough to give me very valuable hints on the subject, and to supply me with many varieties of seed; and I desire here to quote his valuable advice, which will be perused with interest and advantage by all who receive copies of this report.

Hybrids sent by Major Trevor Clarke.

72. The seeds received from Major Trevor Clarke consisted of several varieties, and I have entrusted the tending of them to the officer in charge of the Sheagaon seed-garden. Every precaution has been taken to prevent the other crops, in which purity of species is desirable, being affected by the foreigners.

Major Trevor Clarke writes:—

"I have forwarded for transmission to you a packet containing some of the cross-bred and other cottons for you to try your hand on.

"Observe my Cotton Algebra—

"N. O. × S. I. = New Orleans, crossed by Sea Island; *i.e.*, New Orleans having borne the seed.

"(N. O. × S. I.) + Kidney = the above hybrid crossed by pollen of Kidney cotton.

"When the sample is the hybrid or derivative, the word 'produce' is annexed; otherwise the sample is mainly from a crossed pod.

"Most of the samples, however, have been tested and proved to have been truly crossed.

"*General Memoranda.*

"'Vine' is the fine giant variety of New Orleans called 'Cuba Vine.' The crosses are noble cottons. I wish they may succeed, but they will want good farming and good land. No. 10 is from a strong variety of Sea Island, with rough seeds crossed by Vine. It is a splendid cotton.

"Nos. 5 and 6 are from two different plants of Sea Island; that marked O is very fine.

"Nos. 12 and 13 are from plants of the hybrid S. I. × N. O. recrossed by S. I. and N. O. respectively. One should produce a silky long New Orleans, and the other a Sea Island with hardier constitution.

"No. 7 Vine × N. O. A noble great plant, with strong good staple. Bourbon is the sort, as far as I can make out, which has so often been tried in India.

"I send you a crossed sample and its produce—its produce when crossed by Sea Island 16 and 17. The staple seems spare and flimsy somewhat, and the plant inclined to be robust and rampant. The converse cross will be, I think, better. I will send this by-and-bye. It is not yet ripe.

"Bourbon by New Orleans (No. 18) seems a very nice cotton, and prolific.

"I send a few seeds (No. 13) of Peruvian crossed by my old hybrid. The staple is much improved and softened, and is remarkably strong. I will send more of these Peruvian crosses by-and-bye.

"The sort labelled Pernambuco is not one of the large coarse Brazilians, but a very pretty, compact, prolific, little bushy plant allied to Sea Island, which I received from Pernambuco. The staple is short, but good, which most of the native black seeds are *not*. I have a very good opinion of the capabilities of this merry little sort. I have crossed many pods of it with different plants of Sea Island. Packets marked A, B, V, S, are from different pods crossed by the same plant of Sea Island; two other packets are from pods crossed by two other varieties of Sea Island. You will

see I have also crossed it with New Orleans. Some of these *may* not have taken the cross. I think, however, they have.

"I am testing them, but the pods were hardly ripe when I left home.

"I send a small sample of the fine breed of Indian cotton grown in the Levant, and producing 'Smyrna,' which fetches a better price than the run of real Indian-grown. This must not be confounded with a bad kind of uplands, also grown in these parts. It is a true Asiatic, and the variety to which Linnæus gave the name of Herbaceum. The leaf is broad, with roundish blunt lobes, with large pods which open incompletely. You will see I have used its pollen to cross the ordinary Surats. The pod in the cross opens well, and the staple is greatly improved. I hope, ere winter, to cross this and your fine Hingunghat, of which I have some fine plants from Mr. Ashburner's seed.

"Georgian No. 23 is a very curious cotton, sent from Peru by the botanist and traveller, Dr. Spruce. It was stated to have been of Georgian origin. I can refer it to no other sort that I have ever seen."

These experiments will be watched with great interest, and an account of the results will be given in my next report. Since this part of the report was in type, I have received from Major Dods, Director General of Public Instruction in these Provinces, who is now on leave in England, some valuable hints about hybrids, together with a Memorandum by Mr. A. Hepburn, which will be found in Appendix **B** to this Report.

III.—General measures for the improvement of the Cultivation.

73. Certain other measures applicable both to the exotic and indigenous plant have received the anxious attention of this Department during the past year. Besides the further extension of the cultivation of cotton, which in the present state of native society in these Provinces will long be a matter of difficulty, there is yet another means by which the supply of the raw material can be developed. An acre of cotton land in India hardly produces one quarter of the quantity of clean cotton that can be picked from an American field of the same size. In America, it is true, the soil has not been so much worked as our cotton lands, which cultivation had to some

Cotton supply to be increased by a greater outturn per acre.

extent exhausted whilst America was yet undiscovered. But the great success which has attended the use of "*Fertilizers*" in America having recently, through the exertions of the Cotton Supply Association, been brought to prominent notice, experiments with several varieties of manures will this season be carefully conducted at the seed-farms of Hingunghat, Oomraotee, and Sheagaon.

74. And here it will not be out of place to notice that the advantage of manuring the land is acknowledged and understood by most of the cultivators of this part of India. But their views in the matter are to a great extent limited by their means. In the first place, the agricultural statistics which accompanied Chapter I. will have shown how poor our cultivators are in stock. Without a farm well stocked, high farming cannot, so far as I understand it, be attempted. And then, in addition to this difficulty, there is the circumstance that, in our highly cultivated tracts, the cowdung can but with difficulty be spared. A good cotton-growing tract always means one free of all jungle; and the scarcity of firewood thereby occasioned, obliges the people to burn in large quantities the cowdung which might otherwise with advantage be put down on the fields. There is, indeed, generally a good field in the village, close to the village-site, and boasting of the name of the "*Kari*" field, for which the head-man of the village manages to save a little manure, and which is well known for its excellent crop. And perhaps it has a well in it; and a small patch is irrigated, and a garden crop is raised, and for such a patch a certain quantity of manure will always be spared. But, as a rule, it is only in such cases that manure can be used, although before the sowing season the most careful cultivators will be seen spreading the sweepings of the threshing-floors over their fields. Moreover a great prejudice—rightly or wrongly I cannot say, until further experiments shall have decided the case—exists against using manure in any considerable quantity. The cultivators will tell you that manure with water—as, for instance, in the case of garden cultivation—does excellently, and with a good rainfall, say they, its effects are excellent. But should the rainfall be scant, the manure will do more harm than good: it will excite the plant and drive it to wood, and the cultivator is likely to find a grand crop of cotton-bushes with no cotton, as the manure, without sufficient rain, burns up the plants altogether. All these reasons are urged against manuring the cotton lands, and they are difficulties which, I trust, with some little trouble, may be overcome. The first reason—as in the case of the Dijon keys—is perhaps the most important just now,—there is no manure;

System of manuring as it at present exists.

and I would now proceed to state the measures which it is proposed to take for its supply.

Success with fertilizers in America.

75. In regard to the results which have been achieved in the Southern States America with "*Fertilizers*," since the difficulty of obtaining labour has obliged the planters to turn their attention to the means by which the largest crop of cotton can be raised from the lands which have already been cleared, I must again ask Mr. Dickson, who is deservedly held as an authority in the Southern States, to speak. I quote his letter, republished in the *Cotton Supply Reporter* of the 1st May 1869 :—

Mr. Dickson's experience.

"My last crop of cotton, under the old system, was grown on 950 acres. I made 810 bales. The greatest amount I ever made per acre was on four acres of upland. I used 400 pounds of guano, with the usual quantity of salt and plaster for turnips, and fed them off on the lot. The following spring I added 100 lbs. of guano, 100 lbs. of dissolved bones, 100 lbs. salt, and 50 lbs. plaster per acre, and put in cotton. The crop was 4,200 lbs. seed cotton per acre.

"I will give the details of the preparation, manuring, planting, cultivation, and production of a sixteen-acre lot planted in cotton; and as many may desire to know all the particulars, I will be as explicit as I can be in a letter.

"First, the land is good pine land, and has been under the plough nearly seventy years, and as many as fifty-five years in cotton. About twelve years ago it was sown in oats, with 200 lbs. of guano and bones mixed with salt and plaster, and made 30 or 35 bushels per acre; all fed off by turning stock in the field. Four years ago I left it uncultivated until the middle of July: there was then a heavy growth of weeds on it, just grown. I turned them in, and dropped peas in every third furrow. The result was a large crop of vines, and at least fifteen bushels of peas per acre. These were fed off by beef cattle.

"That, if you call it rest, is all the field ever had. The lot lies between two branches, running north and south; on one slope, next to the branch, is a second growth of pines, the other is a peach-orchard. The cotton was planted on the top of a level ridge, lying within one-fourth to one-half of a mile of Little Ogeechee. It was planted in cotton in 1866, manured with about

150 lbs. of bones and Peruvian guano each, and 100 lbs. of plaster. I commenced the 3rd day of May, with two horses, to prepare the land; cotton rows, four feet apart; ran two furrows in the middle of each row, which stood open about eight inches deep, and applied to each acre 250 lbs. soluble bones, 165 lbs. No. 1 Peruvian guano, and 100 lbs. plaster: salt being too high, I omitted that. The mixture was deposited in the bottom of the furrow; then covered with a long scooter plough, going about as deep as the other two furrows; then ran on the side of each scooter furrow with a good turning-plough, going seven inches deep. After preparing about six acres in this way, I opened with a small bull-tongue plough, dropped the seed, and covered lightly with a board—part of it with a harrow. I continued in this way until the lot was planted, finishing the 15th of May. The land being freshly prepared, and a little dry, it did not come up well. The 25th of May, had a fine shower, and on the first morning of June there was a first-rate stand. About the 1st of June I turned the ploughs back to finish the preparation, running a scooter six (?) inches long in the bottom of each turn-plough furrow, going seven inches deeper; then ploughed up the old stalks with a large long shovel plough, going under the old cotton stalks, making nine furrows to the row; in preparing the land taking nine days, with one horse for every eight acres, which was equal to a full sub-soiling. You observe, the preparation was not expensive. Including planting, it was eleven days' work to eight acres.

"The cotton soon stretched up well. The first ploughing was done with a heavy twenty-two inch sweep (right wing towards the end nearly flat; the back edge of the wing about one and one-fourth of an inch above the front edge in elevation). I then hoed out to a stand the width of No. 2 Scovell hoe, leaving one to three stalks in a hill. Cotton standing thick in the drill will be much forwarder than that which is thin. Give it the necessary distance between the rows.

"The second ploughing was done with the same kind of sweep, with both wings elevated. The second and last hoeing followed in a few days. The third ploughing, ran one furrow in the middle of the rows. The cultivation with the plough occupied one horse five days for each eight acres, which makes two days' ploughing for each acre, and about two days' hoeing for the same.

"The cotton grew so rapidly, it did not need any more work.

I hired the picking of most of it at 40 cents per 100 lbs. The lot averaged about (3,000) three thousand lbs. per acre, but, owing to a storm and other causes, I gathered only (2,700) twenty-seven hundred lbs. and a fraction, which will make two good bales per acre. I picked one hundred bolls in two separate parts of the lot, at four o'clock in the evening of a dry day. Each weighed twenty-one ounces. In the lot was an Irish potato patch that had been manured and mulched with straw twice. I think that portion made at the rate of six thousand lbs. per acre. The next best place was about one acre of old pine field the first year, which made, I think, about five thousand lbs.

"If you expect such results, you must not cut the roots of the cotton. Cotton is a sun plant, as you will see by its turning its leaves to the sun as the latter moves through the heavens. So have a deep-water furrow in the spring, work flat by hot weather, and on a level land run the rows north and south.

"The cotton would have been much better planted the 10th of April. The seasons were as fine as they could be up to the 28th of July; after that, too much rain. The hands I had were all new, and very sorry; the manure was badly mixed and badly put on.

"I found during the wet weather, where the most manure was put, it stood the test best, especially the part that had the most Peruvian guano on it. There was some rot, owing to the density of foliage and wet weather; some boll-worm and caterpillar on about one-half of the patch. The seed planted was of the David Dickson, Oxford, Ga, variety selected twice by myself, and would sell for more than the cotton, if I did not wish to plant them myself. There are none for sale this year. I purchased my manure of first hands, by Messrs. John Merryman & Co., and got the best article at the lowest price in the market. The cotton is unsold. The seed I will use. Below is the cost of one acre:—

Cost of Manure at Plantation.		Horse two days, at $ 1 per day.....	$ 2·00
250 lbs. soluble bones	$ 8·75	Plough, hand, two days, 50 cents	,, 1·00
165 lbs. No. 1 Peruvian guano	,, 6·75	Hoe, hand, two days...	,, 1·00
100 lbs. plaster	,, 1·25	Dropping seed	,, 25
Mixing and putting on	,, 25	Picking	,, 10·80
		Manure	,, 17·00
	$ 17·00	Whole expense per acre..	$ 32·05"

76. Mr. Edmund Ashworth, the Vice-President of the Association, who has been good enough to communicate with me on the subject, thus refers to what has been done in America:—

Mr. Edmund Ashworth's opinion.

"We have of late received such marvellous reports from America of the produce per acre of clean cotton, where abundance of manure had been supplied, that we can scarcely believe it possible. However, it does appear reasonable that an intelligent planter, who was short of labourers, should find it more economical to cultivate 25 acres well than 50 acres badly; for by putting all his manure and good ploughing on the small quantity, he would have less breadth to hoe and weed, and a less breadth to travel over in picking. With 4 cwt. of guano per acre upon land previously growing turnips, a man grew 11 cwt. per acre of clean cotton, and in many places 7 to 800 lbs. The American planters have used many thousands of tons of guano during last spring to stimulate the growth of cotton.

"The Cotton Supply Association felt it to be a matter of so much importance, that we sent out to Bombay 20 tons of artificial manure, to be given away to cotton cultivators, by way of experiment, and to test its success. We sent it out in small barrels of 1¼ cwt. each, to be applied to one acre of cotton land and put in the drill with the seed.

"We ask the Government to allow the Collectors to distribute it and give us a report of the results. I hope you will send down to Bombay, and get some of it for your experiments. We have had abundance of good samples of cotton sent to us, grown in gardens by Europeans from native seed, so that it is no longer a question of possibility as to the quality being improved, provided the soil is manured."

77. The *Southern Cultivator*, a planter's journal of much interest, which I receive regularly through an American friend, is full of the success which has attended the results of the Fertilizers; and to convey some idea of the extent to which they are now used in the Southern States, I extract the returns of the traffic on the railway in this part of America, which show the large quantities sent South during eleven months of the seasons—

Large quantity of guano used in America.

1866-67.	1867-68.	1868-69.
15,333,517 lbs.	10,837,090 lbs.	62,455,215 = 28,000 tons.

78. I am glad to be able here to report the arrival of a large quantity of the "Fertilizers" sent out by the Cotton Supply Association for gratuitous distribution in the cotton tracts, and for experiments to be undertaken by the Cotton Department at the seed-gardens. The Fertilizer is packed in barrels of 1¼ cwt., each barrel containing enough for an acre of cultivated land, and is composed of the following ingredients:—

Guano sent out by the Cotton Supply Association.

1 ton soluble phosphate.
6 cwt. sulphate of ammonia.
6 cwt. nitrate of soda.
8 cwt. Peruvian guano.

Total.....2 tons.

79. Unfortunately the consignment arrived late, and I fear cannot be used now, save as a top-dressing, and laid on with water. But experiments at the seed-gardens are being made so as to test the efficacy of effect of the manure with the various classes of plants and soils, and the results will be watched by me with much anxiety and interest. The following very discreet instructions accompanied the consignment:—

"The experiments with the manure should be made, in as far as may be consistent with other objects, in places easily accessible, by rail or otherwise, near the head-quarters of the collectorates or mamlutdars' stations, where they may be watched closely by the various officials interested. An accurate record should be kept in each case of the nature of the soil in which experiments may be made; the ordinary rotation of crops observed in the field; the last crop raised; the manure ordinarily used (if any); the irrigation or otherwise of the field; the variety of cotton experimented with; the time of sowing and of manuring; the nature of the fall of rain subsequently; the time of the first appearance of flowers, and of the first and subsequent pickings of the cotton; and the quantities in seed cotton by weight, according to the precise area planted.

Their instructions on the subject.

"It may be advisable to try several varieties of cotton together in the same field in parallel rows, not as a general rule, of course, but by way of seeing the effect of the manure. The manure is not intended for mere garden cultivation.

"The Cotton Supply Association will be glad to receive, either direct or through their Honorary Agents in Bombay, full accounts of the results of the experiments, with any remarks which the officials having charge of the same may think fit to offer. The natives should be told without hesitation what the manure is composed of, viz., 1 ton soluble phosphate, 6 cwt. sulphate of ammonia, 6 cwt. nitrate of soda, 8 cwt. Peruvian guano = 2 tons, so that no rumours exciting their religious prejudices be spread about."

Measures taken for testing its efficacy.

80. It is too late in the season to distribute the fertilizers to the cultivators, I think, as the plant is now about 2 feet high, but the greater part of the consignment will be carefully stored until next season, when the barrels will be distributed among the most intelligent of the landholders, the instructions regarding precautions to be taken to avoid arousing the suspicions of the people being carefully observed.

Australian guano purchased.

81. Early in the season the subject of fertilizers had attracted my attention, and Sir Bartle Frere, who still retains his great interest in the improvement of Indian cotton, was good enough to write to me on the subject, and to send me a memorandum of the success achieved in America. The consignment sent by the Cotton Supply Association had not then left England, and I was fortunate, therefore, in being able to secure a few barrels of Australian guano through a friend in Bombay, and experiments have been made with it in the seed-gardens. The Government of India also have recently taken up the subject, and I have received instructions to take delivery of a further supply of this manure, ordered by His Excellency The Vice-Roy in Council, for experiments in our cotton lands. The Australian manures are composed of the following ingredients:—

Special Ceylon Coffee Manure. (Equal to Liebig's.) One hundred parts contain—		*Patent Phosphoric Potash Manure.* One hundred parts contain—	
Azotized organic matter rich in ammonia	28·10	Ammoniacal organic matter	23·5
Alkaline salts	12·30	Alkaline salts	9·5
Lime and carbonic acid	13·25	Phosphate of lime and magnesia	17·5
Sulphate of lime and magnesia	10·25	Sulphate of lime	7·
Phosphate of lime	25·35	Carbonate of lime and magnesia	18·5
Silica	3·75	Vegetable organic matter.	9·
Water (Hygroscopic)	7·	Silicate of alumina and sand	5·
		Water (Hygroscopic)	10·
Total	100·00	Total	100·00

82. Another, and what I hope may prove a yet more effective, mode of supplying this great want of our cultivation has been under consideration. Whatever may prove to be the merits of the imported guanos, I cannot but fear that their expense will prove a serious bar to their general adoption by our cultivators. The supply of a cheaper article nearer home has therefore suggested itself, and I was fortunate enough to ascertain that Dr. John Law, Inspector General of Jails for these Provinces, had been most successful with his experiments for utilizing the "*poudrette*" made under the new sanitary system in large quantities in our Jails, and the effect of which in the Jail garden at Nagpore, and neighbouring fields belonging to the Jail, is certainly surprising. In consultation, too, with the Sanitary Commissioner, Dr. Townsend, I have ascertained that in the large towns this system could be introduced, by which a very large supply might be ensured. I do not lose sight of the fact that there might be difficulties to overcome in introducing this system; but I believe that Government will trust to my discretion to feel my way carefully in the matter. For the present it is perhaps sufficient to say that experiments are being made in the seed-gardens to test the value of this class of manure side by side with the American and Australian guanos.

Expense of imported guanos a bar to their general adoption.

A cheaper article necessary.

Utilization of the *poudrette* of the Jails.

83. Nor has the circumstance been lost sight of, that a manure which may suit an American or Australian soil and climate must not of necessity be expected to have the same effect on our soil in the climate of Central India. So far as I understand the system of chemical manures, to which class the recent imports belong, it is this. The state of the exhausted soil is examined and prescribed for, just in the same manner as a sick patient would be treated; the composition of the soil is studied and its deficiencies noted, and by an analysis of the crop the properties which the plant carries off from the soil are ascertained; a manure is then made up of the chemical ingredients traced in the plant, and carried off by it from the soil, so that the application of the manure renews the ingredients of which, by constant cultivation, the soil has become exhausted, or in which it is naturally deficient. The first step, then, towards providing a suitable fertilizer for our cotton crops should be to examine the state of the cotton-growing lands and the plant itself. This done, it may be possible to prescribe a medicinal manure, according to the chief ailments under which our cotton tract is found to labour. This is evidently the course adopted by those who prepare the Australian manures; for it will be observed that Messrs. Robertson, Wagner, and Compton, who supply the Australian manure, mention in their circular that they "prepare special manures to order, and conduct analyses of soils." Under these circumstances, then, I am not quite sure that these Australian manures, in their present form, will altogether suit us, though, for the reasons noted below, the manure prepared under the direction of the Cotton Supply Association is likely, I believe, to be successful.

Doubtfulness of the suitability of the Australian guano to our soil.

System of chemical manure.

84. Of the two Australian preparations, the "special coffee manure" would appear, so far as I can see, to be the best suited to the black cotton soil, or the "regur," of the Central Provinces and the Berars. It contains, so Dr. Townsend, whom I have consulted on the subject, tells me, more carbon and potash and soda than the patent phosphoric potash manure. For the cultivation of cotton, the more carbon that is returned to the soil the better, for, says Mr. Peddington, "the cultivator should recollect, in a word, that nothing can be amiss which will furnish back to the soil the carbon—that is vegetable matter—of which the plant is constantly depriving it; and that perhaps he only requires a very

Mr. Peddington's opinion.

little addition to his outlay and trouble when he already has decent cotton to make a very large one to his returns." Potash and lime and soda are also necessary to the growth of the plant, and in proportion to the deficiency of these properties noticeable in the soil, should they be supplied. Ansted's analysis of the "*regur*," or black cotton soil, given in the margin, shows that our soil is rich in lime, but wanting in potash and soda. Messrs. Higgins and Bignell, the State Chemists of New York, in their paper on cotton manures, explain that, in many of the cotton plantations in the United States, it is unnecessary to make soda a constituent of the manure, as it is supplied to the soil by the sea and the sea breeze. Now, obviously, our cotton plants enjoy no such advantages, and so soda must be added, and potash too. On the other hand, Ansted's analysis shows that our soil already possesses 16 per cent. of lime; and the large quantity of lime contained in the Australian manures, as given in the analysis at a former page, would hardly appear to be required. The case would, of course, be quite different in the State of Georgia, where the soil appears to be deficient in lime, and where Mr. David Dickson uses plaster of Paris to make up the deficiency. But the above remarks will, I believe, show that you must make your manures for your soil, and that it must not be taken for granted that a Ceylon coffee-manure will suit the cotton-growing tracts of the Poornah Valley.

Analysis of the black cotton soil.

Silica	48·20
Alumina	20·30
Carbonate of lime	16·00
Carbonate of magnesia	10·20
Oxide of iron	1·00
Water and organic matter	4·30
	100·00

85. I believe, however, that the guano sent us by the Cotton Supply Association has been specially prepared in regard to our requirements, and that the Peruvian guano, and salts of various kinds, and nitrate of soda, have been mixed in such proportions as to supply the deficiencies noticed in the soil.

Merits of the guano sent by the Cotton Supply Association.

86. I have no doubt that when our wants are known, a manure well suited to our purpose will be prepared by the manufacturers in Australia, and perhaps, if guano is to be our fertilizer, and if a manure cannot be prepared in India, the supply may be obtained more cheaply from Australia than from England. But this will be a question for future inquiry and report.

87. Believing, then, that an analysis of the soil and produce of the Wurdah and Poornah Valleys was of the greatest importance, I called upon the Assistants in charge of the cotton farms to submit specimens of the soils; and these, together with the cotton seed and fibre, and the grain and stalk of the jowaree plant, which alternates with cotton in the Wurdah Districts and the Berars, have been sent to Dr. Lyon, Professor of Chemistry at Bombay, who, I am confident, will willingly assist me, and will be perhaps good enough to prescribe a medicinal manure for use in our Provinces, and state how far the guano, now sent us, is suited to the wants of the soil.

Further analysis of our soils and manures undertaken.

88. A specimen of the Jail *poudrette*, which has all the advantages of being procurable on the spot and being cheap, will also be analysed; and if, in its present form, it does not quite suit us, it will not perhaps be impossible to add to it, or to prepare it in such a way as to meet our wants. But on these points, any further opinion must obviously be delayed until the results of the analysis is known and this year's experiments have been concluded. The whole question will, however, be of great interest for my next report.

Further report deferred until result of analysis is known.

89. Judging, then, from the results attained in America, we shall hardly be considered too sanguine, if we hope that, by a judicious use of manures, the cotton crop of our Provinces may be vastly increased. I have attempted to show that a cheap supply of manure may be obtained whilst aiding the carrying out of a very valuable sanitary reform. It is perhaps hardly necessary to do more than allude very briefly here to the extreme importance of leaving no stone unturned to increase the cotton supply. This has been declared on high authority to be a matter of national importance, and the cause hardly requires my humble advocacy. But it may be right to mention here, that, in letters recently received from home from the very best authorities, it is stated that the distress among our fellow-countrymen, caused by the limited cotton supply, is again being very severely felt, and that many of the large manufactories are working only $\frac{3}{3}$rds time. The supply necessary to keep all the spindles in Europe at work is calculated to be $4\frac{3}{4}$ millions of bales

Advantages of adopting the manure.

Importance of increasing cotton supply.

of 400 lbs. annually; in Great Britain alone 3 millions of bales per annum, or about 57,000 bales per week are required; and the supply barely exceeds 44,000 bales per week, or only enough to keep the existing establishments at work for 4½ days in the week. To a very large class of our poor countrymen a plentiful supply of cheap cotton is as necessary as bread, as it provides the employment, with the wages of which they are enabled to purchase their bread; and in the face of such facts, the cause can require no attempt at advocacy. When by the side of this it is remembered that this trade is the source from which the cultivators of Central India can draw what is to them almost untold wealth,—that, in fact, what is bread to our countrymen, is certain profit to the producer,—the importance of using every endeavour to increase that supply may perhaps be considered sufficiently established.

90. The success of the experiments with manures in America, and the possibility of providing a cheap manure being borne in mind, the great stumbling-block already hinted at, which lies across the path of the general adoption of a system of manuring the cotton lands, has now to be noticed; and if the importance of increasing the cotton supply has been satisfactorily explained, then the necessity of removing this obstacle will, I hope, be apparent.

Difficulty to be encountered.

91. It has been noticed in a former paragraph that a native, when advised to use manure, will answer, that it is a very risky measure; that its success will depend on the season; that manure and water must go together; that in a wet season a manured field will give a splendid return; that if the rain fails, the cotton, which without manure would have successfully weathered the drought, will be an utter failure, the manure exciting the plant, burning it up, or driving it to wood; that he is a poor man, dependent altogether on his fields; that, even if he had the manure, he cares not to run the risk; and that, as with exotic seed, he prefers a certainty, with moderate returns, to an uncertainty. And, perhaps, he cannot be blamed. Nor would it be wise, having regard to the extreme caprice exhibited by the last few rainy seasons in this part of India, to advocate any general application in considerable quantities of manure. Had this been done last season the result would, I believe, have been very different from what I have now had the pleasure of recording, and the crop would hardly have successfully weathered a season so extremely trying to all classes of cultivation. For without a sufficient supply of water, as the cultivators say, manure, there is good cause to believe, destroys the crops. But

Importance of irrigation accompanying a system of manure.

give the plant plenty of manure and plenty of water, and the result is widely different—the crop will be a magnificent one. Therefore, then, if we wish to increase our cotton supply, we must, I believe, call irrigation also to our aid. It will not do to manure the fields, and risk a failure of the crops from a scanty rainfall. We must *insure* the outturn; and have water at hand, ready to be turned on if necessary—the works being undertaken by Government, and the cultivators paying an annual premium on the insurance in the form of a water rate.

Possible argument against the necessity of irrigation.

92. I am not unprepared for many arguments against the necessity of irrigation. "Indian cotton does not require irrigation," it has often been said; and to this I quite agree. That is to say, to get the cotton of the quality and in the quantity we now do, irrigation is certainly not required. The last season is the best proof of *that*. But then the question is, Are we to be content with the present results? Are we to be content with getting 50 or 80 lbs. of somewhat inferior cotton to the acre? If the answer is that we are morally bound to do our very best to increase the supply, then I altogether doubt any results being achieved without the assistance of the fertilizer; and the fertilizer entails irrigation: and I believe it will be found in the long run that irrigation we must have.

Importance of further experiments.

93. It is quite true that it has not as yet been satisfactorily established that cotton cultivation accompanied by manure and irrigation will succeed.* I am willing to admit this; it is, in fact, the whole point of the argument. For if the question has not yet been satisfactorily decided, the importance of coming to a conclusion on the subject will hardly be denied. Experiments on a very small scale are now being tried at the seed-gardens, but it appears desirable that experiments on a larger scale should be made; and I am in hopes that, by next season, we may have in both East and West Berar small irrigation schemes, with the help of which this question may be satisfactorily tested. It is proposed to irrigate and manure certain cotton fields, and to let the

* It is hardly necessary to go into all the arguments here, which are given in a separate reference to Government. I am only anxious to establish a sufficient case for *experiments*. It will, of course, be said, among other things, that if you bring water home to the people, they will use it for other crops and will give up growing cotton. And, doubtless, to some extent, they will do this at first. But then, again, the cultivation of other crops will be limited by the demand, and directly that has been supplied—and in the case of but few crops will that demand be great—the people will have to fall back on cotton, and help to supply the great vacuum which exists in the trade.

cultivators see the result. If the result of the experiments is such as I am sanguine that it will be, then I have but small doubt that the cultivators will gladly adopt a system which, it may be hoped, will double our cotton supply. Government, indeed, will thus supply what is required above every thing to admit of the improvement of the cultivation—Capital, the people paying a moderate interest. If the people see magnificent fields of cotton grown with the aid of the canal water and our guano, and can ascertain that it pays, they would perhaps not long object to a low water-rate, and it might even be allowable to grant *tuccavee* advances for the purchase of the manure. But before they change their time-honoured customs they must see with their own eyes the merits of our scheme, and must be convinced; and it is with the view of ensuring this that I advocate small irrigation works in the Poornah and Wurdah Valleys. Quite recently I have had the advantage of visiting Mr. Lionel Ashburner in Khandesh in company with Messrs. Lyall and Bernard, the Commissioners of two of the most important Cotton Divisions in the Central Provinces and the Berars; and, as I am aware that the subject has very long occupied their attention, I am sanguine that the scheme will have their fullest support.

94. Lastly, in regard to the successful carrying out of all experiments of this nature, the importance of securing the assistance of trained gardeners, who have made the selection of seed and other agricultural operations a study, has prominently asserted itself. From the exertions of the gentlemen now in charge of the seed-gardens, I hope for valuable results, and they are conducting their duties with care and intelligence. But no one of them has received a training in the science of agriculture such as at the stage to which our experiments have now advanced is found to be necessary. Moreover, these gentlemen, in addition to their duties in connection with the seed-gardens, have another and still more important part to perform. To them is the delicate duty of communicating with the people, and inducing them to adopt the measures, the adaptability of which to the soil and climate and plant of Central India the experiments conducted at the farms will, we hope, firmly establish. And it is absolutely necessary that the officers who undertake this duty, requiring no small knowledge of the language and of the people, and tact and temper, should possess qualifications, and have a position in the service (for unless a man has some position natives are not very ready to follow him), which would not be likely to accompany the agricultural knowledge required. In fact, in the machinery of our work two separate wheels are required. The one, the gardener, works out the

Trained gardeners required.

results; the other, the Assistant, also watches these results, and, perhaps, acquires some knowledge of the manner of their working; but his is the more important duty of indicating the line the experiments are to take, and communicating the results to the people, and convincing them of the merits of our system. The one, as it were, prints the book; the other teaches the people to read it, and explains to them its meaning. For these reasons it is proposed to employ qualified seed-gardeners on our experiments on the same principle as that which has been adopted with much success in the Bombay Presidency.*

Nucleus of agricultural schools.

95. It may here be mentioned that the great object of these seed-gardens being (next to teaching and convincing ourselves) to teach and convince the natives, each Assistant has at his head-quarters several intelligent cultivators who watch the proceedings, and who, at an *al fresco* school, are being instructed in the manner of the improvements which we are attempting to introduce, and are being convinced by practical experiments of the success and merits of the measures which we recommend. The sons of several respectable landholders are also in training, and already form the nucleus of a local agricultural department; and it is to be hoped that, hereafter, these pupils may spread the knowledge they have acquired, and communicate to their neighbours the confidence they have gained, by watching the out-turn of our crops, and that they may thus prove of assistance to our cause, on their return to their villages, on the completion of their education.

IV.—Seed supplied to various Quarters.

96. Such assistance as I have in my power to give towards improving the cultivation of cotton has not been confined to the Central Provinces and the Berars; but during the year I have been in communication with officers in all parts of India, and have done my best to supply information and seed according to the requirements of my correspondents. In my last report it was shown that this Department had been indented on for seed by nearly every Government and Administration in India; and what was said last year is almost as applicable to the season which has just come to a close.

Indents for seed from other parts of India.

97. My largest customers, as heretofore, have been our neighbours of Khandesh. It was apprehended that the Hingunghat seed,

* Since this paragraph has been in type, His Excellency The Vice-Roy in Council, on the recommendation of the Local Governments, has been pleased to sanction this measure.

imported into Khandesh with such marked success, had, during the past unfavourable seasons, deteriorated, and it was determined to secure a fresh supply for this year's sowings. Great interest was evinced both in India and in England regarding the supplies for this important cotton-growing tract; and I was glad, on the receipt of urgent telegrams desiring my co-operation, to be able to report that the seed required had already been purchased and despatched. The quantity indented for this season was 5,000 maunds, or about 179 tons; and, thanks again to the assistance of Mr. James Melville, of the firm of Warwick and Co., Hingunghat, the consignment was collected and despatched without any difficulty, and it all arrived in Khandesh in good time for this year's sowings. The precaution taken by American planters to secure periodical importations of fresh seed from the best cotton-growing tracts, noticed in a former paragraph, would indicate that Mr. Ashburner's arrangements for improving the quality of the Khandesh staple are again likely to be successful.

Large supply sent to Khandesh.

98. In my last report it was explained how the Nimar District of the Central Provinces adjoins Khandesh and West Berar, and how the Cis-Sautpoora lands of Zeinabad and the neighbourhood resemble in soil and other peculiarities the best cotton-growing tracts of Hingunghat and Khandesh. Mr. Vix's opinion, quoted in my last report, proves what excellent cotton can be grown in this district; and Captain Forsyth, now the Deputy Commissioner of Nimar, who, as Settlement Officer, did much to improve the cotton cultivation,—following the example of Mr. Ashburner, and feeling that to achieve decided success these efforts must be steadily persevered in,—decided, this season, to import a fresh batch of seed into Nimar, and 600 maunds, or 21 tons, have been supplied to this district, or enough seed to sow 4,800 acres.

Seed sent to Nimar.

99. Hingunghat seed has also been supplied to the Jubbulpore, Nagpore, Chindwarra, Belaspore, Nursingpore, Mundla, Saugor, Hoshungabad, and Baitool Districts of these Provinces. In lower Bengal, in the Punjab, in British Burmah, Madras, and Mysore, where the past unfavourable season did not give the Hingunghat seed a fair chance, it has been determined to continue the experiments this season, and in all 6,103 maunds, or 218 tons of seed, have been supplied by this Department during the year. The details of these consignments, the arrangements

Other Provinces supplied with seed.

for which entail, as it will be believed, considerable labour, will be found in the following Statement **H.**

100. As indicated above, the experiments tried with Hingunghat cotton seed in other parts of India last season cannot, on the whole, be said to have been successful. It is true that the season was an exceptional one; but still I am somewhat inclined to believe that the results tend to prove that, save in neighbouring districts, possessing similar physical peculiarities, Hingunghat cotton seed is hardly likely to prove a success, and that those who wish to improve the cotton of their districts should devote their attention to the cultivation of the indigenous plant, and should see to the selection and cultivation of seed and other well-known processes of farming. The reports received will be found abstracted in Appendices **C** and **D**. They are hardly as full as could be desired, and in many instances no reports of the experiments have reached me.

Hingunghat seed not successful.

101. I am rather inclined to think that small experiments conducted on this plan are not likely to produce useful results. The Collectors and others who undertake experiments, cannot, as a rule, devote sufficient time to watching them out. Instead of a number of experiments scattered over a considerable tract of country, it would be preferable, I think, to confine the trials to one or two localities where they could be superintended by special cotton officers, after the manner that they will be conducted this season in the seed-farms of the Central Provinces and the Berars. I am confident that careful experiments, requiring, it is true, some special establishments to supervise them, are, in the long run, cheaper than the amateur attempts to which I have just referred, from which no great results can be expected. For these attempts all cost money,—sums small in themselves, it is true, but which in the aggregate would be enough to provide for one or two really valuable trials.

Special experiments, with a few exceptions, necessary.

H.

Statement showing the quantity of Cotton Seed supplied by the Cotton Commissioner for the Central Provinces and the Berars during the Season of 1869.

No.	To whom supplied.	Hingunghat Seed.	
		Maunds.	Seers.
	BENGAL.		
	Applications received through the Government of Bengal.		
1	Commissioner, Cooch Behar Division, Assam	...	10
2	Do. of Presidency Division	13	15
3	Do. of Patna Division	10	15
4	Do. of Bhagulpore Division	8	...
5	Deputy Commissioner, Durung, Assam.....	20	15
6	Do. do. Seebsaugur, Assam	2	15
7	Do. do. Nowgong, Assam	...	15
8	Do. do. Lukhimpore, Assam.....	...	15
9	Do. do. Hill Tracts, Chittagong	1	15
10	Do. do. Singbhoom, Chota Nagpore..	...	15
11	Assistant Commissioner, Palamow, Chota Nagpore	1	15
12	Magistrate and Collector of Cuttack	5	15
13	Do. do. of Howrah	1	35
14	Do. do. of Hooghly.....	1	35
15	Do. do. of Burdwan	2	15
16	Do. do. of Bancoorah	5	15
17	Do. do. of Midnapoor	1	20
18	Do. do. of Bograh	1	15
19	Do. do. of Noacolly.....	1	15
20	Do. do. of Tipperah	1	15
	BOMBAY.		
	Through Inspector-in-Chief, Cotton Department.		
21	Cotton Inspector, Surat.....	12	20
22	Do. Poona	25	...
23	Do. Bombay	6	10
	Applied for direct.		
24	Collector of Khandesh	5,000	...
	MADRAS.		
25	Secretary to the Government of Madras	25	...
	Carried forward.....	5,149	35

No.	To whom supplied.	Hingunghat Seed.	
		Maunds.	Seers.
	Brought forward.....	5,149	35
	MYSORE.		
26	Commissioner of Mysore, for Superintendent, Ashtogram Division	7	...
27	Do. do. for Superintendent, Munchroog Division.	...	12½
	BRITISH BURMAH.		
28	Secretary to the Chief Commissioner, British Burmah	6	10
	PUNJAUB.		
29	Secretary to the Financial Commissioner	50	...
	NORTH-WESTERN PROVINCES.		
30	Secretary to the Board of Revenue, Allahabad.....	10	...
	OUDH.		
31	Secretary to the Chief Commissioner, Oudh.....	10	...
	CENTRAL PROVINCES.		
32	Deputy Commissioner, Nagpore	45	...
33	Do. do. Nimar	600	...
34	Do. do. Chindwarra	4	...
35	Do. do. Belaspore	8	...
36	Do. do. Jubbulpore	40	...
37	Do. do. Nursingpore	1	10
38	Do. do. Mundla	4	...
39	Do. do. Hoshungabad	2	...
40	Do. do. Saugor	2	...
41	Do. do. Baitool	...	4
	THE BERARS.		
42	Deputy Commissioner, Akolah	3	...
43	Do. do. Ellichpoor	140	...
44	Assistant Commissioner, Bassim.....	...	20
45	Seed Garden at Oomraotee	10	...
46	Do. at Sheagaon	10	...
	Total.....	6,103	11½

NOTE.—The Maund is 82lbs., the Seer 2lbs.

H. RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

SECTION V.

MEASURES ADOPTED FOR THE ASSISTANCE OF THE TRADE.

102. Although, as the preceding paragraphs will show, strong hopes are entertained that, by the measures now adopted, much may be done to improve and extend the cultivation of cotton in our Provinces, still it has always been held that the future of the cotton trade in this part of India must depend quite as much on the interests of cotton being carefully watched; on prompt action being taken to remove every obstacle, however slight, that may present itself in the path of progress; and on the requirements of the trade, in the matter of communications being carefully ascertained and represented; as upon any other measures that it may be within the power of Government to adopt. The importance and benefit to both parties of bringing the European merchant into direct communication with the cultivator has been generally admitted, and the more successful the attempts to improve all means of communication with the interior may prove, the greater is the likelihood of this desirable result being attained. With these views, therefore, my attention during the past season has, under the orders of Government, been given to all measures which are likely to tend to the free working of the trade in our districts.

Importance of the purchaser and producer dealing direct.

103. It may, without any unfairness, be said, that, for a long time, the great bugbear of the trade was the Railway Company. Those who now pass up and down the line will not easily believe the accounts of the anxiety, the trouble, and the loss, which the mismanagement of the traffic entailed in former years on the cotton merchants of Central India, and which were thus described in a letter from Mr. Lionel Ashburner, to the Secretary to the Cotton Supply Association in February 1868:—

Former difficulties with the Railway Company.

"The next process is that of pressing the cotton. There is an hydraulic press at Julgaum in Khandesh, and there are others in Berar, but the interests vested in the Bombay presses are so powerful that the up-country presses are seldom used, and the cotton is forwarded in bulk to Bombay. Captain Sherard Osborn, C.B., has proved that the extra cost of the carriage of unpressed

cotton is equal to an export tax of £2-11-0 per ton. An agitation is now in process to abolish the small tax of 4 annas per bale for the Cotton Improvement Fund, though the larger tax, which might be avoided by the use of the up-country presses, is submitted to without remonstrance. This tax is not the only burden to which cotton is subjected by the system of unpressed carriage to Bombay, Each railway station is crowded with acres of cotton bales waiting for waggons to carry them to Bombay: the power of disposing of these waggons is in the hands of the station-masters, and not a waggon is loaded till the station-master has been bribed. In 1866 each waggon was worth Rs. 75 or Rs. 80 to the station-master, equal to a tax of £2-13-4 per ton. There are now more waggons, and the facilities of transport are greater; it is probable that prices (bribes) are lower, but the system is still in force, and is submitted to rather than interfere with vested interests. Every effort has been made by Government officials, especially by Captain Sherard Osborn and General Rivers, to check this system of corruption; but the native cotton merchants will not co-operate in suppressing it, and the European merchants, acting as they do through natives, are obliged to submit to it: without their aid no evidence is available, and a conviction is impossible. During the weeks or months that the cotton is detained at the railway stations, it is entirely without shelter, and exposed to damage from rain, dust, white ants, and fire."

Mr. Lionel Ashburner's opinion thereon.

Luckily these are now all legends of the past; and it is not the least pleasing duty I have to perform, in submitting this report, to notice how entirely satisfactory the arrangements of the Great Indian Peninsula Railway Company for carrying our cotton traffic have now been made.

104. The periodical cotton blocks necessitated the establishment of Government cotton-yards, in which, as described in detail in my last report, thousands of bales awaiting transit were stacked and guarded. This season, the regularity with which the cotton crop during the latter parts of 1867-68 was despatched, was steadily maintained. The bales were loaded on to the waggons and carried off as soon as they arrived at the station, the yards were quite empty, and the precautions which in former years were necessitated by the accumulations of cotton were no longer required. Under these circumstances, it was recommended

Present satisfactory working of the traffic.

that the system of Government cotton-yards should be dispensed with; and the following extracts from my Report, dated 13th February last, will show, how, by the unwearying exertions of Messrs. Knox* and Swan, supported by the efforts of the other officers of the Traffic Department, the greatest stumbling-block in the path of the trade has now been successfully removed:—

"I am confident that the Resident will regard as a very satisfactory feature in the present report the circumstance that cotton is no longer detained at any one of the stations of the Great Indian Peninsula Railway. I have been up and down the line once or twice lately, and I can testify to the excellence of the arrangements as far as regards the transport of cotton. No cotton is now to be found stacked near the stations, save the dokras brought to the presses, or small quantities purposely detained by native dealers in order to complete consignments. The Railway Company have also recently introduced an excellent system of taking delivery of cotton at Khangaon, Oomraotee, and other great markets, and carting it to the stations, and thus much of the cotton is now taken straight to the railway premises, and remains there in the charge and at the risk of the Company.

"With this very satisfactory state of affairs, I have found the precautions adopted during former seasons for the security of the cotton stacked at the railway stations to be no longer called for. There is, in fact, no cotton now to guard and watch. The consignments are generally loaded up a few hours after their arrival; and the establishment of clerks, police guards, men to fill the water-tanks and work the fire-engines, are no longer necessary. I have, therefore, dispensed with their services. In like manner, as the cotton now merely passes through the yards and is no longer stacked there, I have discontinued the levying of the small fees, which in former seasons were collected to defray the expenses of maintaining the yards. The principle on which these fees were levied was, as laid down by the Resident, that it was fair that the cotton stacked on the Government land should pay a slight

* Mr. Walter Knox, as the Resident and Chief Commissioner are aware, has now left India, never to return. It will be remembered that on his departure the Government of Bombay was pleased to acknowledge most handsomely in a Special Resolution the valuable services rendered by that gentleman. I am confident that the Government of these Provinces will desire to be reminded, that to the devoted labours of Mr. Walter Knox the relief granted to the cotton trade, and many Government Officers, by the great improvement in working the traffic, is chiefly due.

ground-rent sufficient to cover the cost of the establishment for the security of the property stored thereon. Although these small payments were gladly made and scarcely felt by the cotton owners, and although it was admitted on all sides that the system of cotton-yards was a very great convenience to the public, still these fees were a tax, though a very slight one, on our up-country cotton, and added to the many expenses which our cotton has to bear, and which, so far as it lies in my power, it has always been my constant endeavour to reduce. As the establishments could be dispensed with, I was very glad to have an opportunity of stopping the collection of the fees, and I am glad to be able to report that the cotton blocks, which in former seasons caused so much trouble, loss, and anxiety, have ceased to exist, and that with them has gone the system of Government cotton-yards.

"These satisfactory results have not been secured without the expense of an immense deal of labour, forethought, and arrangement on the part of the officers of the Great Indian Peninsula Railway Company; and as on many previous occasions I have had to submit wearying reports of the delays, and the want of arrangement, and of the many evils which attended the cotton blocks, I hope I may now be permitted to bear testimony to the determination evinced from the first, under the present management, to grapple with and overcome the difficulties which had been allowed to accumulate, and to the perseverance and energy of the officers of the Traffic Department, by which one of the great impediments to the progress of the cotton trade in these Provinces has been so successfully and expeditiously removed.

"The fire-engines, water-tanks, sheds, &c., have been removed to the adjacent cotton markets, where they will be found useful, and I hope these measures may meet with the approval of the Resident."

105. The Resident at the Court of Hyderabad, in supporting my recommendations, and submitting them for the sanction of the Supreme Government, was pleased to pay a well-deserved compliment to the Traffic Department of the Great Indian Peninsula Railway Company, and which had the honour of being approved by His Excellency The Vice-Roy and Governor General in Council, and has since been noticed by Her Majesty's Secretary of State for India, in a despatch of a recent date.

Discontinuance of the cotton-yards recommended.

106. Besides improved traffic arrangements, the convenience of the trade has been further consulted by the Railway Company by a system of carting the cotton from the great markets (which, as is well known, are at some distance from the line) to the railway stations. The advantages of this arrangement to merchants and agents at Khangaon and Oomraotee is considerable. The purchasing agent receives a receipt for the cotton immediately it is ready for despatch, and, on forwarding the receipt, can draw without delay upon the house for which the commission is executed; and as the Railway Company, from the time of taking delivery of the cotton until its arrival in Bombay, undertakes all risk, the receipt is as good as cash.

Carting agencies at the large markets.

107. The system of pressing the cotton in the districts in which it is grown, noticed by me in my last Report, has during the past season made great progress. It has already been explained that the cotton is packed in two different sorts of bales—the half-pressed bale, in which the cotton is condensed to about 12 lbs. to the cubic foot, and the full-pressed bale, in which the density varies from 28 lbs. to 32 lbs. to the cubic foot. The half-pressed bale is an arrangement to economize space in the railway waggons, and to facilitate the carriage of the cotton from the interior to the great market at Bombay. In Bombay, the half-pressed cotton is re-examined and passed through the "full-presses," in order that the shipping freight to Europe, which is calculated on the size of the bale, may be reduced to the lowest possible limit. This double pressing is obviously saved when the cotton is full-pressed in the first instance up-country; and I am glad to be able to report that the latter system, *i. e.* that of full-pressing the bale, has increased in a remarkable manner during the past season. From the first I was doubtless sanguine, but the results have exceeded even my expectations, and I doubt whether the many gentlemen with whom two years and a half ago the merits of the system were discussed were prepared for the figures given in the following paragraphs.

Progress of the system of pressing.

108. The number of "bales" exported (for of course the loose bags, or dokras, are not admitted under this category) has greatly depended on the establishment of presses in the interior. The following Statement **I.** will show the progress made in this respect during the past few years:—

New presses set up during the year.

I.

Statement showing the Number of Cotton Presses at work in the Central Provinces and the Berars in 1867, 1868, *and* 1869.

	Full-presses.			Half-presses.		
	1867.	1868.	1869.	1867.	1868.	1869.
CENTRAL PROVINCES.						
Wurdah	..	..	..	5	2	3
Hingunghat	1	5	4	6	10	10
Arvee	..	..	..	..	5	5
Poolgaon	..	..	..	..	..	1
Deolee	..	..	..	..	..	3
Total	1	5	4	11	17	22
BERARS.						
Oomraotee	..	4	6	12	21	35
Chandoor	..	..	..	..	..	1
Budnaira	..	*1	1	4	..	2
Moortizapoor	..	..	..	..	4	9
Karinjah	..	..	..	..	2	2
Akolah	..	..	..	..	3	6
Akote	..	2	2	..	8	8
Sheagaon	..	2	2	6	16	18
Khangaon	2	6	8	10	25	38
Nandoorah	..	..	..	..	..	2
Julgaum	..	..	..	..	2	2
Telara	..	..	..	..	..	2
Total	2	15	19	32	81	125
Grand Total for the Central Provinces and the Berars.	3	20	23	43	98	147

Total 1867 .... 3 Full-presses ; 43 Half-presses = 46
Total 1868 ....20 do. ; 98 do. = 114
Total 1869 ....23 do. ; 147 do. = 170

H. RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

* In process of erection.

Thus in 1866, when Captain Sherard Osborn and Mr. Cordery were advocating the system, these Provinces did not boast of a single press. During the year 1867, 43 half-presses were set up. In 1868 the full-presses began to work. In the year under report we have in the Central Provinces and the Berars 147 half-presses and 23 full-presses, or sufficient power to press the whole of our cotton crop.

Number of bales pressed.

109. I now come to the number of bales pressed during this season as compared with former years. The accompanying table, which gives in detail the number of full-pressed bales, half-pressed bales, and dokras exported during the last few years, will show at a glance the progress that has been made:—

Statement showing the number of Full-pressed Bales, Half-pressed Bales, and Dokras, exported from the Central Provinces and the Berars in 1866-67, 1867-68, *and* 1868-69.

	Full-pressed.	Half-pressed.	Dokras.
1866-67	5,088	53,181	680,641
1867-68	33,604	147,444	141,811
1868-69	70,500	177,775	74,595

Proportion of pressed to unpressed cotton.

110. The full-pressed bale, as a rule, represents a larger quantity of cotton than the half-pressed bale; the half-pressed bale is as large again, sometimes three times as large as the dokra. Taking into consideration the relative sizes of these different bales, the following table in which the percentages are given shows how the pressed cotton has increased during the last few years, and how the dokras, or loosely-packed cotton, have been nearly completely driven out of the field:—

Percentage of Cotton exported during the undermentioned years in—

	Dokras.	Half-pressed.	Full-pressed.	Total loose Cotton.	Total pressed.
1865-66.....	100	.....	.....	100	...
1866-67.....	85	13	2	85	15
1867-68.....	27½	55½	17	27½	72½
1868-69.....	8	66	26	8	92

Or in other words, in 1866 the whole of our cotton went down to Bombay in loose bags or dokras.

In 1867 the system of pressing was commenced. At first "full-pressing" did not make much way, 2 per cent. only of the crop passing through the full-presses. The half-presses, however, secured 13 per cent. of the cotton, and the nett result was that in that year 15 per cent. of the crop went down pressed, more or less, against 85 per cent. of dokra cotton.

In 1868 the proportion of full-pressed and half-pressed cotton advanced to 17 per cent. and 55½ per cent. of the crop respectively, against 27½ per cent., the figures to which dokras had sunk, or nearly three-fourths of the crop being pressed against a balance of one-fourth of loose cotton.

Now, this season, the number of full-pressed bales has risen to 70,500, and the half-pressed bales exceed 177,000 of a crop of 270,000 bales; that is to say, 26 per cent. of the crop now goes to the full-presses, and 66 per cent. to the half-presses, making the percentage of pressed cotton to dokras as 92 to 8.

111. The foregoing Statement will have shown that during the year the full-press, the property of the Berar Company at Budnaira, has been got into working order, and that Messrs. Jules, Siegfried, and Co. have started two full-presses at Khangaon. And not only has the pressing power of the Berars received this valuable reinforcement, but the presses recently established are of the latest and most improved pattern, and are specially adapted to the requirements of the peculiarly dry climate of the Berars. The charge for freight, either on the railway by which the bales are carried to Bombay, or on board the ship or steamer by which they are conveyed to Europe, is calculated on the space occupied by the bale; *i. e.*, the charge is by measurement, and the Railway Company let two tons of well-packed cotton go down to Bombay for the same price that is charged on one ton of cotton in dokras. Again, the sea freight to Europe is charged by the ton, which ton by sailing ship represents fifty cubic feet, by steamer forty cubic feet, the freight per ship ton being about 2*l.* 10*s.*, by steamer about 5*l.* The cost of the conveyance from Khangaon to Liverpool of, say, 400,000 lbs. of cotton, or 1,000 bales, will thus depend very much on the density to which cotton is packed. Now, the climate of the Berars during the cotton season is so dry, and the cotton so elastic, that great difficulty is experienced in getting into the bale the quantity of cotton

Improvement in the style of press.

which can be packed without effort in the moist atmosphere of Bombay. In the first place, the "box" which receives the supply of cotton for the bale, can in most presses with difficulty be made to hold the requisite quantity of cotton, and then the pressing power is often insufficient to condense the cotton to the required size. With the help of improved machinery all these objections have now been met, and the disadvantages under which our up-country full-pressed bales at one time laboured have now been removed, and our bales are now made of such a size as to secure a low freight.

112. In my last report it was noticed that the cotton markets of the Berars were placed at a great disadvantage by being cut off from the line of telegraph. On the matter being represented to the Supreme Government, orders were immediately issued for connecting all the cotton markets of the Berars by a special telegraphic line. The work was commenced after the rainy season of 1868, and before the cotton began to be brought into the markets, Khangaon, Sheagaon, Akote, Akolah, Oomraotee, and Hingunghat were all in direct communication with one another, and, of course, with Bombay and the Lancashire cotton markets also. The convenience to the trade is great. Financially too, looking at the question from a Government point of view, the lines are a success. For, although some of the smaller stations do not pay well, the profits at Khangaon and Oomraotee more than balance the deficiency. As the line over which the cotton orders have to travel is often burdened with the messages of the through traffic between Bombay, Nagpore, and Calcutta, it has been determined to provide a separate line for the cotton work, which will prevent any delay in the forwarding of the cotton messages, and I am sanguine that by next season the wants of the trade in this respect will be found thoroughly supplied. On the whole, the working of the lines during the season was satisfactory, and the cotton trade is certainly under obligations to the Telegraph Department for the promptitude with which the line was constructed, and for the efficiency with which the service was performed.

The telegraph line extended to the cotton markets.

113. It is perhaps hardly possible to overestimate the importance to the trade of improving the postal service at the cotton markets. Inefficiency in this department causes the greatest inconvenience to cotton merchants; letters, containing important information or orders,

are delayed or go wrong, and the consequent complications are numerous.

The importance of improving the Postal communication.

I am impressed with the importance of Khangaon being made, during the cotton season at least, a first-class Post Office, and of a more efficient staff being provided for it than has been the case during the past two seasons. The matter has been brought to the notice of the Postal authorities, and it is to be hoped that there will be an improvement in the Postal service at the cotton markets during the approaching season.

114. During the year under report, the Postal Department have improved the arrangements for despatching the mails from Khangaon. Formerly, the letter-bags were despatched to Sheagaon and Nandoorah, the nearest railway stations, situated each about twelve miles from Khangaon, by runners, who took an unlimited time doing the distance. This necessitated the mail leaving Khangaon unnecessarily early, so that it was almost impossible to reply to advices received from Bombay by the post of the same day. Tanga Dâks, or light mail-carts,

Tanga Dáks established.

have now been placed on the roads between Khangaon and Sheagaon, and Khangaon and Nandoorah, and also between Budnaira and Oomraotee. This arrangement, besides accelerating the service of the mails, is a convenience to travellers, who can procure seats on the carts, and are thus spared toiling along the road on the creaking bullock-carts.

115. During the year due attention has been paid to the improvement of the lines of road. It is true that Hingunghat is still isolated from the railway, and that all the cotton from that market has to pass across a rough country track. The construction of a first-class road to the market has been under consideration for some time past. But I confess that I esteem a very bad road as a most valuable addition to a large cotton market, as providing the best of arguments for the extension of a cheap branch of railway. Hingunghat lies midway between Chanda and the main line, and discoveries of coal, the value of which it would be difficult to overrate, have recently been made by Major Lucie-Smith at Chanda itself. There is every hope that a line of railway may be constructed, which, besides carrying the coal, will greatly assist our cotton traffic. Of all districts in these Provinces, Chanda is one of the richest in natural products, and besides coal, boasts of

Importance of a branch line of railway to Hingunghat.

excellent iron, stone, and timber. Beyond Chanda is situated the Edulabad country, in the territory of His Highness the Nizam, which provides some of the very best of the excellent cotton brought to

the Hingunghat market. This tract produces considerable quantities of cotton, but the Chanda District and the neighbourhood, being the stronghold of the Dhêrs and outcastes, who live chiefly by spinning and weaving, a large proportion of the cotton grown there is worked up into yarn and cloth. European piece goods are but little used, and two years ago, when at the Chanda Fair, I noticed the arrival of one of the first consignments of Manchester *dhoties*, or loin cloths, which were very readily bought up. Now it is not too much to hope, that, with a branch railway to this tract, European piece goods might be imported so as to undersell the native cloth. And the effect would be, that, not only would a larger supply of the raw material be obtained,—for what is now worked up into yarn would be exported,—but the large population now employed in spinning and weaving would be made available for agricultural labour, and thus the jungle land might be broken up and the cultivation extended. Hingunghat, besides being a great cotton market, is also an important mercantile centre, and is the mart from which all the country to the south-east draws its supplies, and besides the exports of cotton and other goods a considerable import traffic might be expected. By the time I submit my next report, I hope to be able to notice the commencement of this very necessary line.

116. Considerable relief has been granted to the cotton traffic which pours into the Berar markets from the southward by the construction, under the orders of the Commissioner of West Berar, of a road leading down the Ajunta range of hills to Khangaon. The approach from the high table-land to the Poornah Valley was difficult, and the cotton coming from above the ghats or hill ranges had to be slung pannier-fashion on bullocks, and was the only cotton which was brought to market in the *Bhojáh*.* With the present arrangement we may soon hope to see even this relic of the past swept away. Sanction has also been received to the improvement of the Sheagaon road, but the work is deferred so as not to interfere with the works now in progress on the Khangaon railway, noticed in a later paragraph.

Road down the Ghats in West Berar.

* The meaning of this word was explained in my last report, but, for facility of reference, the note is introduced again here. In the market of the Berars, cotton is sold by the Bhojáh of 280 lbs. or 266 lbs. nett, about three of which Bhojáhs go thus to the Bombay kandy. Bhojáh literally means a load, *par excellence* a *bullock-load; i. e.*, the two bags of cotton which are slung pannier-fashion on a bullock's back. The name takes us back to the times when all cotton was brought to market, and sent on to Bombay or Mirzapore on *bullocks*. Now-a-days this class of carriage is seldom used, save for the cotton grown above the ghats (or hill range), or brought from a great distance south in the Nizam's country.

117. In regard to "roads," in the general acceptance of the term, by which I mean a line along which a carriage drawn by horses can be driven at a tolerable pace without danger to life or limb, it must be admitted that the Berars have but little to boast of under this head. But there is much to be said in explanation of the non-existence of a network of metalled roads; and although I will admit that, to the occasional traveller, who may by chance have to visit some outlying village, the process of being jolted along a country track in a bullock-cart is most uncomfortable and annoying, still I think that most of those who know the country will bear me out when I say that the inconvenience resulting to the cotton traffic by the absence of roads is not so great as many have imagined.

Absence of metalled roads in the Berars.

118. The great difficulty in making roads in Berar is the scarcity and inferiority of the metal, or stone, or gravel, without a very thick coating of which no object is gained by incurring the expense of constructing a road; and I suspect I am not far wrong in saying that, to make a thoroughly good metalled road in the rich valley of the Poornah, where the black soil is in some places from 80 to 100 feet deep,—and I mean a road which will stand heavy traffic, and the metal of which will not after a short time disappear some half a dozen feet below the black mud,—that to make such a road would not cost much less than half the price of a light railway. The road from Budnaira to Oomraotee, for example, is passable enough, but, if common report can be believed, the amount spent on this road has already exceeded the estimate of the cost of the projected light railway to Oomraotee. It is obvious, then, that some time must elapse before many roads of this class can be completed. And unless they are roads of the very first class, they are in reality worse than no roads at all. They are in bad weather simply embankments of loosely piled-up black earth, which have not even the merit of the comparative consistency of the black cotton soil in the fields below. Even to a European traveller, a "made-road" of an inferior class is in many respects less acceptable than a country track; for whereas the "road" is made on the principle of piling up mud, the country track, with the help of constant traffic, manages, in some parts of the districts, where the loam is not deep, to dispose of the coating of black soil, and to arrive at a firmer substance below.

Difficulty of making a good road in the black soil country.

119. As regards the native traffic, the people during the fine weather,—and it will be noticed later that, in an agricultural Province

like the Berars, there is hardly any traffic save during the fine months, —often prefer a cross-country track to our hard metalled roads. And there are several reasons for this. A road to be metalled, so as to be of real merit according to our ideas, must be so hard that either it necessitates the shoeing of the bullocks, or cuts their feet to pieces, and as those who accompany the carts have much walking to do, the hot hard road is equally unmerciful to their feet also. Added to this, there is the fact that the native cross-country tracks suit the carts and bullocks of the people tolerably well. What to a European traveller is a long row of intolerable ruts, is to a native cartman, during the dry weather, a sufficiently convenient road, which his bullocks will follow safely whilst he quietly slumbers. Some years ago, when making the land revenue settlement of the Wurdah District, I attempted to describe in the following extract the class of country track in the Nagpore Province, specimens of which may be recognised in the Berars:—

"In addition to these roads, each village is connected with its neighbour by a cart track, which, being somewhat peculiar, deserves a few words of description. These tracks generally consist of two parallel ruts situated at about 3 feet apart, varying in depth from a few inches to 1½ feet. It is by means of these ruts that most of the internal communication of the district is conducted. It may at first appear incredible that any cart laden with cotton can live on such a road. But in reality they are not very badly adapted to trade, as it now stands. The two ruts—the one being always parallel to the other, and of exactly the same depth—act indeed as a sort of tramway. The carts are all made of the same 'gauge,' and the bullocks are so harnessed that they trot comfortably along in the ruts; the sharp narrow wheels of the cart running smoothly along, and cutting like a knife through any inequality that may present itself. By the help of these ruts the carts travel along easily enough. It is when sets of carts going in opposite directions meet, that mischief is done: one set of carts must leave the line of tramway, and break-downs are not unknown. In many tracks, however, a right and left tramway are established, and the rule of the road is strictly observed. Along these tramways, 'ringhees' or light chariots, drawn by fast-trotting bullocks, carry the landholders along at a famous pace, for your Wurdah landholder never rides, the ringhee or bullock chariot being the means of locomotion always adopted by him; and, in fact, in

Country tracks in the districts.

some parts, where the cart tracks are deep and the cotton soil full of holes, the ringhee is adopted even by European officers. Riding is almost impracticable, for the distance between the ruts is not sufficiently broad to admit of a horse moving at any pace, and the ruts themselves are dangerous for any horse that puts his foot into them. On the metalled roads the effects of these ringhees and carts, with their sharp wheels, are most disastrous; ruts cut deep through the metal, and, laying bare the earth below, mark their progress. But it is to be hoped that a new system of roads will give birth to a new style of carts.* The old ringhee and cart-wheel are but the necessary consequence of an utter absence of metalled roads, and it is to be hoped that good roads will be followed by carts with broad wheels, which, indeed, are already beginning to make their appearance. For the present, until the system of roads connecting the villages is improved, the carts and the cart tracks suit one another well enough. No traffic takes place save in the fine season; for during the rains, even if any produce remained to be exported, the cattle are at work in the fields and cannot well be spared during those months, the busiest of the year to the agriculturalists. The carts manage to get along the hard dry road quite easily, but a shower of rain, or a nullah swollen by a fine-weather shower, is a serious obstacle, resulting in much delay and many broken axles. These axles, however, are easily replaced. Being of wood they wear themselves out by degrees, and when one snaps another is fitted in, each cart-driver carrying several axles, slung like spare anchors at the bow of his cart, ready for any emergency. In fact, the length or difficulty of a journey is often described by the number of axles expended; and I have heard it remarked, that before the arrival of the railway Poona was reckoned to be a journey of 1,000 axles from Nagpore."

120. Of course, during the wet weather, these tracks are utterly useless. But then it must be remembered that in these Provinces from November to May, when the trade is brisk, there is hardly ever any rain, and, as noticed in the above extract, there is hardly any traffic in the interior of a district during the monsoon. In the first place, there is no produce remaining in the country; the crop has all long since been carted to market and sold; and the carts have all been taken to pieces, and the

* There will always be this difficulty. It will be long before the system of roads can be so elaborated as to connect every village, and the cart will have to travel some distance before it can reach the made-road.

pieces ignominiously hung up in one of the out-houses. And there is again this reason, noticed above, that, even if there were any produce to be carted, and roads along which to cart it, neither the bullocks nor the drivers could be spared. The cart has given way to the "*bukhur*," or light plough, and the Koonbie, who, when the fine weather returns, hopes to cart a fine crop of cotton to market, is now at work in his field, and is weeding his crop with the assistance of the pair of bullocks which is to tug the cart and the bags of cotton to Khangaon when the season comes round. There is no doubt that a little rain during January or February causes immense inconvenience, and renders the nullahs, or water-courses, impassable. And for this reason, until the system of really good roads (or I would prefer to see a series of light railways or tramways) can be completed,—and this must be a matter of time,—it is desirable, instead of spending money on indifferent roads, to assist the native tracts, to build bridges* in some places where a troublesome water-course is met with, to improve the approaches to rivers, and to keep up a small establishment on the most frequented routes for the purpose of inspecting the line regularly, and of aiding the traffic by filling in with brushwood any place where water and mud have accumulated, and where the passage of carts is rendered difficult, to the detriment of axles as noticed above.

121. These arrangements, although they do not much conduce to the comfort of Europeans travelling in the interior, and whose visits, it may be remarked, are few and far between, are of no inconsiderable relief to the chief traffic of the country, and during the past season the measures noticed above have received the attention of the Commissioners of Divisions and the District Officers. It is, however, to be hoped that in course of time no place of any importance may be without either a really good road, or a tramway or railway.

---

* I remember laughing, in my ignorance, some years ago at what was pointed out as the remains of a "road" constructed by a former Rajah of Nagpore. The remains consisted of what may be called "willow-pattern" bridges, the hogged backs of which were distinguishable at intervals, but unconnected by any "made-road." These bridges ensured communication during the fine months, and the whole system succeeded passably enough even after heavy unseasonable rain. For the difficulty with the nullahs, which long remained troublesome and muddy, was thus got over. Even during the heavy rains the bridges were useful. The swollen stream rushed under the high back of the bridge, and as there was little masonry to resist the force of the waters and throw them back, the stream, even if part of it found its way round on either side of the bridge, was always fordable there.

122. The matter of the greatest importance to the cotton trade that has been under consideration during the past season, has been the extension of branch lines of railway to the great cotton markets. One of the most noticeable features in the Great Indian Peninsula Railway Line in our Provinces is that, with charming unconcern, it is carried at a considerable distance from all large commercial centres. The inconvenience is great, and the journey of 12 miles across country from the railway station to Khangaon by road is more trying than the whole run from Bombay to Nandoorah. And the same may be said of Oomraotee, which is six miles from Budnaira. The case of Hingunghat, which is left 22 miles to the south-east, has already been noticed.

Extension of the railway to the great cotton markets.

123. The importance of constructing branch lines to Oomraotee and Khangaon has long been advocated by the Resident at Hyderabad, and the Commissioners of East and West Berar, in whose Divisions respectively these cotton-markets are situated. The case of Oomraotee is a very strong one, and has been exhaustively reported on by Colonel Nembhard, the Commissioner of Division. For not only is Oomraotee a great cotton market, but its general and perennial trade is very extensive,—an advantage of which Khangaon, which beats it easily in the matter of cotton, cannot boast. Oomraotee is the great central depôt for piece goods, metals, groceries, and all the articles of import from the Western Coast finding favour in the local markets, which draw their supplies from here. Before the opening of the railway, Nagpore was dependent on Oomraotee; and even now the banking transactions of this important place ramify all over Central India, and many of the Central Provinces Bankers have branches there. For its cotton trade it is celebrated. The Mofussil Company have a Ginning Factory there, and a pair of full-presses worked by steam. Several European agents are engaged in purchasing cotton here during the season, and Mr. Augustus Breul, who has established himself there, has a pair of full-presses at work. The number of half-presses is very large, and the following figures of last season's cotton traffic will speak for themselves:—

The branch line to Oomraotee.

Importance of Oomraotee.

Full-pressed bales	23,384
Half-pressed bales	37,608
Dokras	883

Statement taken from Colonel Nembhard's Report showing the Import and Export Trade of Oomraotee.

	Tons.		Value.	
	Import.	Export.	Import.	Export.
			£	£
Sugar	754	39	31,689	1,636
Salt	2,578	105	50,529	2,068
Wheat	6	468	53	4,261
Rice	1,201	3	21,855	56
Other Grains	54	1,073	382	7,512
Metals and Hardware	1,099	85	153,760	11,955
English Piece Goods	731	68	157,580	14,090
Miscellaneous European Goods	72	1	9,063	135
Spices	144	24	19,349	3,278
Silk	11	½	14,520	726
Ghee and Oil	156	113	10,185	7,350
Cocoanuts	1,168	107	42,503	3,882
Miscellaneous, including Oil-seeds, Country Cloth, Lac, Tobacco, Stationery, Dyes, Hides, Horns, Timber, &c.	5,382	1,014	39,591	21,058
Total	13,356	3,100½	551,059	78,007
Government Stores	4,530	.....	.....	.....
Cotton	.....	10,946	.....	844,398
	17,886	14,046½	551,059	922,405
Grand Total	Tons 31,932½		£1,473,464	

124. For the figures of the general trade of Oomraotee given in the preceding Statement, I am indebted to Colonel Nembhard, the Commissioner—thanks to whose exertions the Oomraotee cotton trade may soon hope to hail the arrival of the railway at their market. The whole trade, then, of Oomraotee may be taken at 31,932½ tons and £1,473,464 annually. It will doubtless be considered strange that a place of so great importance should have been left at a distance of six miles by the Great Indian Peninsula Line. When it is noted that, in addition to the above circumstances, Oomraotee is the head-quarters of a District and a Division, and is on the high road to the military cantonment of Ellichpoor, the importance of a branch line to this place will hardly be questioned. The matter has been represented by the Commissioner and the Resident, and the survey of the line has now been sanctioned. It has been my privilege to assist this cause, by urging from a cotton point of view the importance of the construction of the line. For the present, and until the line is completed, Oomraotee has the advantage of possessing a good road between the market and the railway station. The existence of this road may, however, fairly be said to have been to some extent a disadvantage to Oomraotee. Had there been no road—as in Khangaon's case—then the railway to Oomraotee must have taken precedence of the sister line to Khangaon, which has now the start of it.

Trade of Oomraotee.

125. For next season both the cotton bales and the visitors may, it is to be hoped, be spared the bumping across the Khangaon-Nandoorah road. The construction of the branch line of Railway had long been urged by the Resident at Hyderabad. As a cotton market Khangaon ranks above Oomraotee. It is indeed the largest cotton market in India. The accompanying Memorandum, submitted to the Resident in March last, and which received his support, will best explain the importance of this place, and the need in which it stood for an improvement in its means of communication with the railway. Writing in February last, I said:—

The branch line of railway to Khangaon.

"I hope that the Resident may not consider me unpardonably importunate, if I desire again to urge the requirements of Khangaon in respect to means of communication with the railway. During the last two years I have asked for a good deal for Khangaon, and, thanks to the interest taken by the Resident in the place, and the zeal and energy of the District authorities and the Officers of the Public Works Department, those suggestions have been sanctioned and carried out,

and Khangaon can now bear comparison with most towns in India. Where, then, so much has been so successfully done, it does seem a great pity that a good road, the most urgent and important of all the requirements of a great market, should remain unsupplied; and I trust that Mr. Saunders, knowing the great interest I have in this place, may hold me excused if I again trouble Government on the subject, and pray that no time may be lost in providing Khangaon with improved means of communication with the railway.

"2. As I fear that at first sight my demands may not appear very modest, it may be well to premise by alluding to the position Khangaon now holds. During the last few years the trade has greatly developed, but inconveniently placed as the market is, at a distance of twelve miles from the railway, few, save those who have business there, visit it; and as unless the market be seen during the season, the wealth and importance of this little 'up-country' town cannot easily be realized. Khangaon has, I fear, generally been regarded as an inconsiderable place, for which the ordinary provision in the way of roads is ample. I hope, however, to be able to show that, although my demands may not, at first sight, appear very moderate, still that they are not more than the importance of this great market requires.

Importance of Khangaon as a cotton market.

"3. If I am not mistaken, the census showed Khangaon to contain about 9,000 inhabitants. But then the calculation was made late in the year, when the season was over, and when the large floating population that congregates here from November to May had returned to Bombay. But few towns can boast of such a very large proportion of rich residents as Khangaon. The 9,000 are made up of the handful of Koonbies, who till the Khangaon lands, of some few shop-keepers, and a large body of rich merchants and bankers, who buy and sell cotton during the season, and who, making Khangaon their centre of operations, work from here the cotton trade of the Berars. Most of them have been established here for many years, and have substantial well-built houses. And many of the native firms of Bombay have branches here and own considerable property in Khangaon—houses and gardens and groves of trees, in which their agents reside during the cotton season, The importance of Khangaon as a great cotton market has recently been appreciated by the European merchants of Bombay, and within the last two years several firms have established themselves here. Moreover,

The wealthy classes of which the population of Khangaon is composed.

two large factories for cleaning cotton, and three establishments for 'full-pressing' the bales, all using steam-power, are at work here during the season, besides a large number of half-presses. The European firms now established at Khangaon are the following:—

European firms and companies established there.

"The Berar Ginning and Pressing Company, Limited. (Factory for cleaning cotton, and Steam Presses for packing the bales.)

"The Mofussil Ginning and Pressing Company, Limited. (Factory for cleaning cotton, and Steam Presses for packing the bales.)

" Messrs. Booth and Co.

" Messrs. Bomanjee, Touche, and Co. (Bombay Firm has an Agency here.)

" Messrs. A. C. Brice and Co. (Bombay Firm has an Agency here.)

" Steuart Macnaghten, Esq.

" Messrs. Roghé and Co.

" Messrs. Jules, Siegfried, and Co. (Bombay Firm has a branch here, and presses worked by steam for full-pressing the bales.)

" Messrs. C. Smith and Co.

"There is also a Branch of the Bank of Bombay here; and a Carting agency for carrying off the cotton has recently been established by the Great Indian Peninsula Railway Company.

"4. These large factories and the steam cotton presses employ very large establishments, consisting of European Managers, Assistants, and Engineers. The staff required by the European cotton agent for purchasing cotton is also considerable. And the European official population is now beginning to increase. Besides the Cotton Commissioner, who is obliged to spend much of his time at Khangaon, an Officer of the Commission has lately been appointed to the Small Cause Court and to the general charge of the town. An Assistant Engineer, an Officer of Police, an Apothecary of the Medical Staff, and some employés of the Telegraph Department, have been added during the year, and the

Officers recently appointed to Khangaon.

appointment of so many new Officers may be accepted as indicating the growing importance of the place. The wants of Khangaon, in respect to public buildings, have been very liberally and promptly supplied, and a new Cotton-market, a House and Court for the resident Officer of the Commission, a Market-place for the general market, a Serai, Travellers' Bungalow, Post Office, Dispensary, and new School-house have been built, or are in course of construction. The Postal communication has been improved, and Mail-carts now run between Khangaon, Nandoorah, and Sheagaon, and a branch of the Government telegraph, by which Khangaon has been placed in communication with all the cotton markets in India and Europe, has been opened.

Local improvements effected.

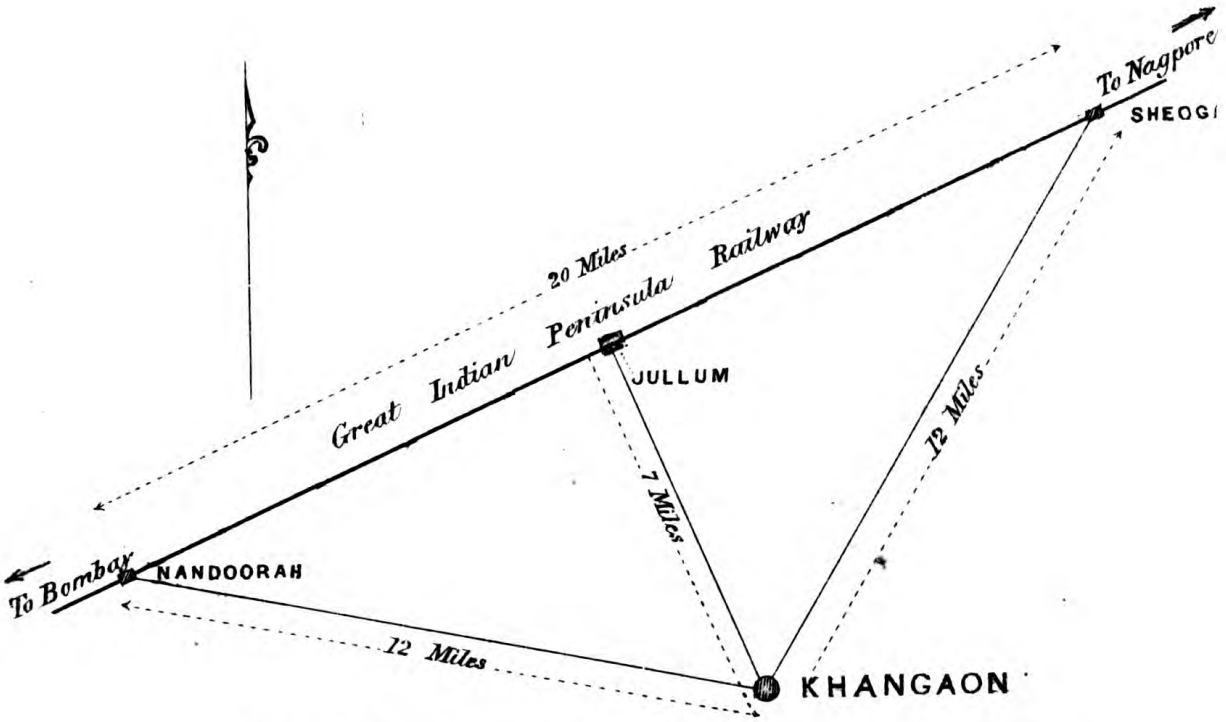
"5. The cotton trade, always very considerable, has developed in consequence of the presence of so many purchasers, and Khangaon is not only the largest cotton market in the Berars, but the largest in India. In a good season the quantity of cotton sent away does not fall short of from 80,000 to 100,000 bales, and the trade of Khangaon during a short season that hardly extends beyond four months, may be taken to represent about £1,000,000 sterling.

Development of the cotton trade.

"6. I hope I have said enough to establish the importance of this cotton market. I now propose to notice the provision that has been made for connecting Khangaon with the Railway, and I shall conclude by stating, what, in my opinion, the circumstances of the place require.

"7. I have already noticed that Khangaon is inconveniently situated at 12 miles from the nearest railway station. Its position will perhaps be more easily explained by the help of the accompanying rough sketch:—

Inconvenient position of Khangaon.



"Khangaon thus stands at the apex of an isosceles triangle, the base of which consists of the line of the Great Indian Peninsula Railway running from Nandoorah to Sheagaon (the two nearest stations opened to traffic), the sides being formed by the lines of road connecting Khangaon with Nandoorah and Sheagaon. The length of the base is, roughly speaking, about 20 miles. The roads forming the sides are, as nearly as possible, equal, each being about 12 miles long. If a line be drawn from Khangaon at right angles to the railway it would touch Jullum, a 'crossing station,' as yet unopened to traffic. The length of this line would be about 7 miles.

Means of communication at present existing.

"8. The means of communication at present existing consist of the roads from Khangaon to Nandoorah, and from Khangaon to Sheagaon, already noticed. As yet there is no road to Jullum.

The Imperial line to Nandoorah.

"9. Nandoorah being the station nearest to Bombay, and the road being an 'Imperial' one, it may be convenient to notice this line first. Nandoorah and Sheagaon being the only two railway stations near Khangaon, it was wisely determined, in days gone by, to make

the Imperial road to Nandoorah in preference to Sheagaon, for the obvious reason that the trade being all with Bombay, goods carried to the former station would save 20 miles in time and in freight. The road is at present in a wretched state. It has been made on the principle of throwing up black earth, and then topping the earth with loose kunker. The kunker either gets ground down into the earthwork, or lies loose on the top of the road. The smaller nullahs have been bridged. Two considerable rivers intersect the line. They are not bridged. To bridge them would cost,—Captain Mead will say exactly how much,—but I am confident it would be a matter of some lakhs of Rupees. The gradients leading to and from the rivers are severe, and the beds of the rivers are very troublesome for carts. Even if the road were macadamised, and in thorough order throughout, these rivers, in their present state, are such serious impediments to traffic, that the road would be of comparatively small value. Lastly, the Imperial road is grand in its mile-stones, solid, well-executed, and placed with becoming regularity.

The country track to Sheagaon.

"10. The other road, or track, has, I believe, enjoyed none of the advantages of the assistance of either the Public Works Department, or the District authorities, save in the matter of a few Rupees spent near the third mile last year in putting some fascines into a bad nullah. Being a country track it has been worked out on quite a different principle to the 'made-road' to Nandoorah. It has had no kunker lavished on it, and no loose earth has been thrown up, so that where the ground is hard near the surface, the continued grinding of the traffic has secured a good foundation, and by degrees has made for itself something of a road. Where the soil is black, it is no worse than the 'Imperial road.' And it avoids the two rivers, the great obstacles to the Nandoorah line. The nullahs are not bridged, but they are insignificant, and save after heavy rain, which seldom falls during the cotton season, do not give much trouble. They could easily be disposed of. It has no mile-stones.

Comparative merits of the two roads.

"11. A correct idea of the comparative merits of the two roads will best be gathered from an incident which recently occurred. A few weeks ago a member of the firm of Messrs. Jules, Siegfried, and Co., who have just built press-houses at Khangaon, had to bring up from Bombay the boilers and other heavy pieces of the machinery belonging to their presses. Now, although Nandoorah is 20 miles nearer to Bom-

bay than Sheagaon, and thus 20 miles of railway freight on heavy machinery would have been saved in unloading at the former station, and notwithstanding that the Nandoorah road is an 'Imperial' one, the firm determined—wisely, I think—to cart the machinery across by the country track from Sheagaon to Khangaon. The Nandoorah road was heavy and bad,—the two rivers presented almost unsurmountable obstacles to carts heavily laden, so the country track, bad as it was, was preferred,—and the machinery, with great difficulty and expense and delay, was ultimately triumphantly landed at Khangaon.

"12. The above description does not, I fear, say much for the state of the communications between the railway and the largest cotton market in India, a place that sends away annually its 100,000 bales. I hope I have said quite enough to show that some improvement is required. I may now perhaps be permitted to state the manner in which, I believe, these improvements might be most conveniently and expeditiously effected.

"13. A reference to the rough sketch of the position of Khangaon will show that the shortest line to the railway is by Jullum. It is true that, as yet, there is but a 'crossing station' here, and that it has not been opened for goods or passenger traffic. But the reason of this is to be traced to the fact, that there being no road from Khangaon to Jullum, no traffic finds its way there. Open a road to Jullum, and the traffic would soon converge on this place, and the traffic there; no great delay would take place in opening a goods station. The country between Khangaon and Jullum is particularly easy; the two rivers which cross the Nandoorah road are avoided, and the distance saved is considerable, Jullum being 7 miles, Nandoorah and Sheagaon each 12, miles from Khangaon. To a busy merchant, who is obliged to go to the railway station about his cotton, it makes a great difference whether he has a ride of 15 miles (the distance from Khangaon to Jullum and back), or whether he has to do 24 miles by either Nandoorah or Sheagaon. And the saving to the cotton traffic would be great. It is true that Jullum, being about 10 miles east of Nandoorah, Khangaon cotton sent from the former place would be weighted with an additional 10 miles of railway freight which the bales

The line *viâ* Jullum recommended.

"NOTE.—In all these distances I am writing rather without book. The Chief Engineer has all the measurements, and will correct my figures, if necessary; but any slight discrepancy in the distances will hardly affect the correctness of the conclusions at which I hope to arrive."

loaded at Nandoorah would escape, but this difference would be more than counterbalanced by the convenience of the proximity of the railway station, and the reduction in cart hire in conveying the bales from Khangaon to the railway. This is always a heavy charge; and as the carts would make three trips to Jullum in the time they would take to go twice to Nandoorah and back, a saving in cart hire would be effected, which would more than make up for the slightly enhanced railway freight.

Its advantages.

"14. A further argument in favour of the line of road being taken to Jullum would be this, that assuming, as I hope I may be permitted to do, that it is the intention of Government to connect their greatest cotton mart with the railway by means of a first-class road, then the line to Jullum would be the very cheapest. It is hardly to be expected that the Sheagaon line will find many advocates as *the* outlet for the Khangaon trade. It would hardly do to carry our cotton that has to go to Bombay 20 miles down* the line; and then the distance of Sheagaon from Khangaon, 12 miles, as compared with Jullum, which is but 7, would be a conclusive argument against this route. To compete with the Jullum line, then, there remains but the Nandoorah road. On its behalf may be advanced that it is partly made and bridged, and that it carries our cotton 10 miles nearer to Bombay than would a line through Jullum. But, if I have sufficiently explained myself in the preceding paragraph, the proximity of Jullum, and the saving of cart hire, counterbalances these advantages. And then to the Nandoorah line, the following fatal objections may be urged. To put these 12 miles in thorough order, to make of it a first-class macadamised road, or the class of road which I submit the requirements of Khangaon demand, would cost a very large portion of the sum that would have to be spent in making a road to Jullum. And then the Nandoorah road is, I hope I have conclusively shown, of but little value unless the two great stumbling blocks, the rivers that intersect it, be bridged. The Chief Engineer in his estimate will be able to show the difference in cost between repairing and metalling the Nandoorah road, and building the two bridges, and in making a first-class road to Jullum. I am much mistaken if the balance is not greatly in favour of the Jullum scheme.

Cheapness of this line.

---

* "This is the language of the railway. The trains go '*up*' to Bombay, and '*down*' to Nagpore, and thus when you descend the Ghats you are going 'up' the line, whilst when climbing the Thull Ghat it is correct to say you are 'going down.'"

"15. If these premises are not incorrect, then, I hope, the importance of connecting Jullum with Khangaon without delay may be admitted. I now have to turn to another branch of the subject, and to urge the importance of constructing this road in such a manner as to admit of rails being laid on it; in fact, to advocate that this road may be made the means of bringing the railway into Khangaon.

Importance of constructing this road so that it may carry a railway.

"16. And here, in a paragraph *en parenthèse*, it may be necessary to allude to the great anxiety evinced by all connected with Khangaon to see the railway brought home to this great market, and to notice the arguments for and against the construction of a branch line. If my description has conveyed any idea of the trade of the place, then it would seem that it may hardly be necessary to urge much in regard to the importance of connecting this market with the railway by means of a branch line. But I am not unprepared for the arguments that may be advanced against such a scheme. The whole of the trade, some may say, must come sooner or later to the railway, and Khangaon will soon be left high and dry, with a useless branch line constructed at great expense. Although no one would be more heartily glad than myself to see the markets more to the main line, I have not as yet noticed a tendency, consequent on the advent of the railway, to shift the great trade centres. It is true that Wurdah, Akola, and Sheagaon can now boast of some cotton trade. But this represents a small local business, which formerly was done in detail in the neighbouring villages, and which has now been concentrated in these towns, without affecting the trade of the great markets. Sheagaon perhaps intercepts some few cart-loads of the cotton intended for Khangaon. But the Khangaon market does not depend only on the cotton that crosses the railway line, but is fed by the produce of the Ghâts lying to the south, and the rich country to its east and west. Moreover, as a rule, the Koonbie, even although he may save a 12-mile journey, and a like distance on his return, will prefer going on to Khangaon to parting with his cotton at Sheagaon. For at Khangaon the number of buyers is larger, and prices generally range higher there than at any other market; and the Koonbie, to whom at a season of the year when field work is over, time is of no great consequence, with his own carts and bullocks, and a sufficient store of fodder, finds it to his advantage to go on to Khangaon and get

Grounds for advocating the construction of a branch line of railway to Khangaon.

Arguments for and against the scheme.

a slightly enhanced price for his cotton. Moreover, at present at least, Khangaon is undoubtedly the centre of the trade. Here are the many merchants and the many traders, and the Marwarees who advance money on cotton, and who, with their agencies spread over the country, have many of the Koonbies in their books. And here it is that the Koonbie, if he has any 'business' to transact, in the way of settling up his advances, can most conveniently do it. All these circumstances tend to ensure the stability of Khangaon. Moreover here at Khangaon all the principal native merchants for many years have been established, and the European agents, rightly or wrongly, have made it their head-quarters. And where the buyers are, there the trade will undoubtedly come. As yet, at least, not the slightest disposition has been evinced by the merchants to shift their quarters. Many of them have comfortable houses and gardens and groves here, and are the owners of considerable property in the town, and they are hardly likely to relinquish these conveniences, and to go and settle near the railway, so long as they can ensure the trade coming to them. The port of Carwar on the Malabar Coast is a remarkable example of the disinclination of native merchants to leave the market at which they have traded for years, and to which they are thoroughly accustomed, for any other place, notwithstanding the many advantages the change may offer. With the exception of Bombay, the only port on the Malabar Coast is Carwar. Here even large ships can load with ease and in safety, and the advantages offered to the coasting trade are great. Coompta, for many years the great outlet for the cotton of Dharwar, is distant only about 30 miles. There is no harbour here, but a river with an inconvenient bar, which renders the loading of cotton a matter of difficulty at all seasons of the year. But yet the cotton merchants of Coompta, notwithstanding the many advantages that have been crowded on Carwar, by the construction of roads, wharves, steam presses, &c., have not been induced to exchange Coompta for the port, regarding the relative merits of which no doubt can exist. And I am inclined to believe that the same causes that have protected Coompta will be found to favour Khangaon, in the event of there being any idea of removing the trade to some place on the line of railway. All natives, and particularly those engaged in trade, are notoriously superstitious. And to the man who for many years has done a good business at Khangaon, or whose forefathers for one or two generations have driven a rattling trade there, there is something very uncomfortable in the idea of shifting the place of business. With it may come a change of luck, they think. One has

heard of gamblers, who, having won large sums of money, will not on any account change their seats lest their luck should change too. And it is not difficult to understand the feeling of natives in these matters, who at heart are all gamblers more or less. Leave Khangaon for Sheagaon, some think, and our luck will leave us too. Added to all these reasons, a large amount of capital has now been invested at Khangaon by both Europeans and Natives. The two large ginning factories and the three establishments for pressing cotton represent several lakhs of rupees, and their owners are not likely to desert Khangaon without a struggle. As, then, Khangaon is not likely to go to the railway, I think our best endeavours should be directed towards bringing the railway to Khangaon.

Improbability of the line being taken up by any company.

"17. I have already indicated that I would desire to see this object accomplished by the roadway being supplied by Government. And here I am prepared for the argument that such works should be left to private enterprise, and that if a railway is required between Khangaon and the main line, then those interested in the trade of the place should be able to provide sufficient capital for the purpose. But putting out of the question of the line ever paying more than 5 per cent., I would submit that merchants and agents trading in cotton, of which the population of Khangaon is chiefly composed, are not the class that can be expected to invest money in a railway. What capital they have is required for the purposes of their trade, and for them to go and invest any part of it in a railway, which would perhaps yield a safe return of 5 per cent., would resemble, in some degree, the burying of the talent. If I am not mistaken it is not from this class that capital to construct railways is raised. The merchant can find a more profitable investment for his money in the legitimate business of his trade. But it is the half-pay officer and others not in trade, who have some little money, and who want a safe investment for their capital, who take up railway shares, the dividend on which is guaranteed by Government. Nor do I think that a branch railway to Khangaon, constructed under the ordinary conditions, would pay. The outlay would be great, and the cotton trade of a few months (the return trade of piece goods and 'kerana' (groceries) is comparatively small) would have to pay the working expenses and the interest for the whole year. It is hardly to be expected that any company would be induced to take up such a scheme.

"18. If, then, a branch line to Khangaon would be of great service to the cotton trade,—and there is no prospect of the scheme being taken

up by private enterprise,—we may fairly be permitted to invoke the assistance of Government in the matter. And if it can be shown that this great desideratum can be provided without any expense beyond that which must, under any circumstances, be incurred in constructing a first-class road between Khangaon and the railway, perhaps I may not be considered too sanguine if I still hope that the scheme may receive the approval of Government.

"19. Now the Agent of the Great Indian Peninsula Railway has said (I have not the correspondence at hand) that if a road were made to Jullum he would open a goods station there. In a later letter he promised that, if Government would make the roadway, the Company would lay down the rails from Jullum to Khangaon.

Promise of the Great Indian Peninsula Railway Company to lay down the rails.

"20. I hope I have shown that the construction of a road between Khangaon and Jullum is indispensable. The construction of the roadway in such a manner as to enable the Agent to fulfil his promise of carrying the rails to Khangaon would be of the very greatest advantage to this great market and the cotton trade. The work, which would necessitate the observance of gradients and curves which an ordinary road would not require, and every arrangement to admit of the rails being laid, would not, I am informed by our highest authority in these Provinces, exceed the cost of a first-class metalled road. Such a roadway, though expensive in regard to these gradients and curves mentioned above, would not require to be macadamised; and the expense of metalling these 7 miles would balance the extra cost which the construction of a line fit to carry rails would entail, and the extra outlay would thus be nil. Assuming, then, that Government is prepared to sanction a certain number of lakhs for the purpose of placing Khangaon in communication with the railway, there would be, I am confident, every desire on the part of Government that that sum should be expended in the manner most conducive to the interests and convenience of the public. And having a great interest in the place, and some knowledge of its requirements, I venture to submit that the object of Government would best be secured by constructing the road in the manner indicated. The public buildings and the ground about Khangaon have all been laid out with due regard to the prospect of the railway ultimately finding its way there, and

Construction of roadway for rails not more expensive than a first-class road.

arrangements for the station premises could be made without any difficulty. Moreover, with the assistance of the zeal and energy of Mr. Izat, I doubt not that, if sanction were obtained to the scheme without delay, the roadway might be finished by next season, and the laying of 7 miles of rail is but the matter of a few weeks. I do, therefore, most humbly and urgently pray for the sanction of Government to the commencement of this important work.

"21. There is perhaps one other point which should not be left unnoticed, and that is the favour with which the Railway Company would regard the project. But in the first place we have the promise of the Agent to lay the rails if Government will construct the roadway, and then, again, there can be no doubt of the advantage that would accrue to the Company by the traffic being diverted from Nandoorah to Jullum. Ten miles freight would be gained on nearly all the cotton exported from Khangaon. And although it might not pay an independent Company to construct a branch under the ordinary conditions, it would doubtless be to the interest of the Great Indian Peninsula Railway to work a line which would be got on such advantageous terms. The expense of the roadway—the great outlay I believe—would be saved to them; and the interest on the permanent-way, and the expenses connected with the working, would be much more than repaid by the large cotton traffic and the additional ten miles of freight (from Jullum to Nandoorah) that would be ensured. The Great Indian Peninsula Railway, with its large establishments close at hand, could work such a branch much more economically than any independent Company, and the staff at Khangaon and along the line could be employed during the season only, and the buildings, &c., would be of the most economical description. I hope, then, that it may be fairly considered to be to the interest of every one that this line should be constructed.

Advantage to the Great Indian Peninsula Railway of this scheme.

"22. I fear, however, that the requirements of Khangaon will not be quite satisfied by the opening of the branch railway. The Nandoorah and Sheagaon roads, already noticed, require some attention. As for the Nandoorah road, which is merely a railway feeder, if the branch line is once opened to Jullum this line will be hardly ever used; and I would not recommend the expenditure of much money on it, save so much as may be required to keep it in decent repair and to improve the gradients at the rivers. But the case of the Sheagaon road is somewhat different. The opening of the branch railway will

not affect the traffic here. The importance of the Sheagaon road does not depend on its being a feeder to the railway, but consists in its being the road along which much of the cotton that comes to Khangaon is carried. During the season it is crowded with carts. And as a link which connects the cotton markets of Khangaon, Sheagaon, and Akote, it has its importance. Moreover Sheagaon is a large place, and is rising rapidly. Being conveniently situated between Akote and Khangaon, merchants, who do business at both markets, keep an Agent at this central place, and send their cotton there to be loaded on the railway. And a factory with full-presses has been established there, and the place is now becoming of sufficient importance to require direct means of communication with the neighbouring markets. Eventually the road from Khangaon to Sheagaon should be continued to Akote, the crossing at the Poornah being put in order. I would therefore strongly advocate the improvement of the Sheagaon road, the bridging of the nullahs, &c.

Improvements required in the Nandoorah road.

On the Sheagaon road.

"23. In conclusion it may be convenient to give a brief summary of my recommendations.

"I submit that the importance of Khangaon demands that it should be connected with the railway by means of a first-class road.

Summary of recommendations.

"That the shortest and cheapest line would be to Jullum.

"That it is desirable that this line should be constructed in such a manner as to admit of rails being laid down on it.

"My reasons for this recommendation being, that, in the first place, this work will not cost more than a first-class metalled road, and that the Agent of the Railway having promised to lay down the rails if Government will provide the roadway, Khangaon can thus be furnished at no greater expense to Government than would be incurred by the construction of a road—the necessity of which is indisputable—with that, the greatest desideratum of our trade, a branch line of railway.

"That as the construction of such a line will greatly affect the utility of the Nandoorah road, which is merely a railway feeder, I have only to ask that it may be kept in repair and the gradients at the rivers improved. But the Sheagaon road being an important link between the cotton markets of Khangaon, Sheagaon, and Akote, and

not depending for its importance on the traffic to the railway, I recommend that it be improved and bridged, and eventually extended to Akote.

"24. Before closing this Memorandum, I must again beg to be held excused if I have been over importunate, or if I may appear to have attempted to advocate somewhat too strongly the requirements of the most important of all the cotton markets with which I am connected. But I am deeply impressed with the advantage that will accrue to the trade from the scheme which I have now again the honour to submit. Owing to its growing importance, and its proximity to Bombay, Khangaon is now annually visited by many merchants and others interested in the cotton trade. If the many local improvements and conveniences that have recently been provided for the trade, such as cotton markets, &c., be shown to visitors, they will perhaps remark, "Oh yes, these are all very nice, but what a fearful road it is between this and Nandoorah!" And it may not unnaturally be supposed that in undertaking these works we had begun at the wrong end, and that when the market and the railway had been connected by a really good road, then, and not till then, it would have been time to think of these minor conveniences which, as compared with the great work required for Khangaon, are as nothing worth. The trading interest naturally enough consider that the Cotton Commissioner is in some degree responsible for this great want not having been supplied. And I am doubtless to some extent to blame, for I feel that had I been able on former occasions to represent, as clearly and forcibly as the case deserved, the requirements of the place, some scheme for the improvement of the means of communication between Khangaon and the railway would doubtless have been sanctioned. But, in extenuation, I must urge that this is a subject which received my attention immediately after I joined the appointment of Cotton Commissioner, and that the present scheme was submitted to the late Resident on his visit to Khangaon in 1867. Sir Richard Temple took much interest in the place, and warmly supported the scheme. A survey was made, the line to Jullum was marked out, and until recently I was under the impression that the roadway for a branch line had been sanctioned. Moreover, as regards the local works, it was possible to carry them through promptly, whilst for a project such as an expensive road, surveys had to be made and references submitted, all of which required time. I would now ask the Chief Engineer and Secretary to the Resident in the Public Works Department, who

knows the ground thoroughly, to correct my figures if necessary, and to supplement this Memorandum with any data which he may be able to adduce in support of a scheme, which I sincerely trust may receive, without delay, the sanction of Government."

126. It will be seen that it was hoped that if Government constructed the roadway the Railway Company might consent to lay down the rails. As, however, the Directors would not agree to this, and as, moreover, the arrangement was for many reasons objectionable, His Excellency The Vice-Roy in Council decided that a State line of railway should be constructed between Khangaon and Jullum. The work was commenced in June last, and has already made considerable progress, and will be ready for traffic in January next. It is hoped that it may then be opened by His Excellency The Vice-Roy in person, to the great personal interest taken by whom in the matter the cotton-traders are indebted for the promptitude with which this very necessary work has been sanctioned and is now being carried out.

Commencement of the Khangaon State Railway.

127. Arrangements are being made to consult the convenience of the trade as much as possible, and it is hoped that it may be arranged to run sidings from the line to the steam cotton presses, so that the bales pressed there may enjoy every advantage. Recently, moreover, the Great Indian Peninsula Railway Company have completed the arrangements by which waggon-loads of full-pressed bales brought from up-country can be shunted on to the wharves or bunders at Bombay, whence the cotton is taken direct to the shipping in the harbour. The completion of these arrangements tempt me to refer to the following extract from a Report, quoted some years ago by the late Governor of Bombay, Sir Bartle Frere, then Member of the Supreme Council in Calcutta, in a letter addressed to an officer in Central India, in which he urged the improvement of the means of communication between the cotton markets and the sea-ports. This extract (from the Report of General Balfour, C.B.) describes very vividly the condition of the trade at a comparatively recent date. It will show those whose introduction to the cotton trade in the interior has been subsequent to the completion of the railway, the very great change that has taken place during the last few years, and will help to remind us all of the importance of perfecting the communications in the cotton districts, if we desire to ensure the stability of the trade.

Facility with which the traffic will be carried.

General Balfour wrote:—

"Formerly the greater part of the cotton of Berar was taken 500 miles on bullocks to Mirzapore on the Ganges, and thence conveyed on boats 450 miles to Calcutta. Now, the greater part goes to Bombay, still wholly on pack oxen, the distance varying from 126 to 450 miles, according as the cotton is purchased at one mart or another. The hire of a bullock for the journey ranges from about Rs. 5 to 16, the chief cause of variation being the time of year: a load is about 250 lbs. But this is not by any means the whole cost of conveyance; the indirect expenses are much greater,—the cotton is eaten by the bullocks, stolen by the drivers, torn off by the jungles through which the road passes, and damaged by the dust and the weather, as well as by having to be loaded and unloaded every day, often in wet and mud.

Present cost of the conveyance of the Berar cotton to the port of shipment.

"The Bombay Cotton Committee* of 1847 state their opinion, after careful calculation, that the whole charges of conveyance to Bombay from the mart of Khangaon, only 216 miles distant, being the nearest of all, do not fall short of Rs. 33 a kandy (784 lbs.), the original cost of which at the latter place is not more than Rs. 50; thus the cost of carriage to the port of shipment is 66 per cent. on the price of the commodity. The usual selling price in Berar is under one anna (1½*d.*) a lb., as we learn from Royle, as well as from the paper just quoted and various other authorities; the absolute cost of conveyance from the producing country to Bombay is, therefore, fully 1*d.* a pound. And this, though it seem small, is, in fact, enormous on so low-priced an article. So that in the Report of the Cotton Committee above referred to, the rise of even one halfpenny a pound at Liverpool is spoken of as operating most beneficially on the Bombay market.

"And we cannot regard the formation of good roads as less important, or less essential, to the prosperity and advancement of the country than the extension of irrigation. The two species of improvement are intimately connected, and should go hand in hand. Without the means of transport, and of interchange, the most valuable products become a drug, and production is arrested: thus roads give value to produce, and large production gives a use and value to roads. No advantages can make up for the want

* I was a member of the Committee, and all *our* calculations were under the mark.—(Signed) H. B. E. Frere.

of the means of transport. At the present time good wheat is selling in the Berar valley at Rs. 5½ (11*s.*) the quarter, and the whole cost of freight and charges from the Coast to London do not exceed 15*s.* a quarter. Yet, in the absence of good roads, and of all attempt to improve the noble Godavery for navigation, the cost of carriage from the place of production to the coast effectually keeps it out of the market. For at present the only means of exit for the produce of Berar is by carriage, on pack oxen, either to Bombay, a journey of 60 days, 400 miles to Mirzapore on the Ganges, and then 500 miles down that river to Calcutta; whereas if the Godavery River, the natural outlet of that country, were opened to navigation, the cotton and other valuable produce it yields would reach the sea-port of Coringa, at its mouth, in 70 hours. On the other hand, a ton of salt, which is sold at the Government stores on the coast for Rs. 27, costs Rs. 112 at Nagpore. We have already adverted (para. 433) to the enormous yearly loss in the carriage of the cotton of the same country to the sea-coast by land instead of by the river, and have noticed what large supplies of that article of the best quality for the English market would immediately flow out if the navigation were opened."

Although the Godavery does not carry off our produce, still the means of transport, from Khangaon at least, will soon, I believe, be as complete and satisfactory as could possibly be wished; and it is not too much to hope, that, next season, the cotton grown around Khangaon, purchased at the market there, and pressed at the adjoining factories, may not have to leave the rails, from the time that it is rolled from the press-house into the waggon, until its arrival on the wharf at Bombay; and it will not be difficult to calculate the time that will be necessary, with the assistance of the telegraph which joins Khangaon and Liverpool, the complete railway communication between the market and the port of shipment, and with, perhaps, the Suez Canal to assist still further in the transport of our cotton, to execute an order sent from Liverpool and to land the required number of Khangaon bales in Lancashire.

The Godavery navigation scheme.

128. The above allusion to the Godavery suggests that this report should contain a brief notice of the navigation works now in progress, which, as the above extract will show, were designed to carry the cotton traffic of these Provinces. The Godavery near its source is known to all railway travellers between Bombay and our cotton markets, and the shakiness

of the bridge, which at one time necessitated an arrangement whereby the passengers were turned out of the carriages, in the dead of night, and obliged to walk across the bridge, will, apart from other reasons, have impressed the existence of the Nassick stream on many nervous railway travellers. The Adjunta range, of which the low hills around Khangaon are the outworks, and which in an irregular line may be noticed to the south of the railway for the whole of the route between Nassick and the Wurdah, divides the watersheds of the Godavery, and the Poornah, an affluent of the Taptee, and the network of streams which contribute their waters to the Western and Eastern Oceans respectively. The whole of the rich cotton-producing country lying beyond the boundary of the Berars to the south of that Province, and which helps to supply our markets during the season, is drained by the former river. The tract is also a great cotton-consuming country, and Nandeir, where the Godavery is crossed on the ride between Akolah and Hyderabad, is celebrated for its cloth manufactures and the exquisite fineness of the yarn made there. Beyond Nandeir, at Mudnoor, the boundary of the trap formation is passed, and with the trap formation end the black loam soil and the cotton cultivation; the journey to Hyderabad being for the rest through the sandstone country, with grand reservoirs for irrigation, and rich rice fields. From Nassick to a point opposite to Seroncha, the head-quarters of the Upper Godavery District, where the river receives the waters of the Wurdah—or the Pranheeta as it is here inconveniently called—the Godavery is unnavigable. Some years ago, during the height of the monsoon, when the river was consequently very full, the steamer which carried the Chief Commissioner, Sir Richard Temple, and his staff, to which I then belonged, attempted to ascend the river, but after several attempts we were obliged to return, having made rather less than a dozen miles; and the river for the rest of its course is, I believe, equally unpromising for craft of any size. This is the Godavery proper, or improper as it might perhaps be less incorrectly termed.

The Godavery near Nassick.

129. For the "Godavery," which on account of its navigation scheme is well known to, and has some interest for, the cotton trade, is not in reality the Godavery, but the Wurdah River. The Wurdah is crossed by the railway at the Poolgaon station, about half way between Budnaira (Oomraotee) and Nagpore, and forms the boundary between the Berars and the Central Provinces. A line drawn north and south at the Budnaira station

The Wurdah River.

would pretty accurately divide the watershed of the Poornah (an affluent of the Taptee) and the Wurdah. In fact, at Budnaira itself may be seen a cotton field, the surplus rain water of which may be said to be divided between the Eastern and Western Oceans of India, the ridge being drained by two streams, the one of which flows into the Wurdah, the other into the Taptee River.

130. The Wurdah flows for many miles through a very rich cotton-growing country, and receives on either bank the streams that drain some of our best cotton lands. The Wunna, which joins it some distance below Poolgaon, is the river on which Hingunghat is situated. Nearly opposite Chanda, where Major Lucie-Smith has recently made such valuable discoveries of coal, it receives the Pyngunga, a river which, draining the southern portion of the Berars, flows past Edulabad, a place hardly less celebrated for its cotton than Hingunghat itself. Further south again, on its left bank, the Wurdah receives the Wyngunga, which flows through some fine but, as yet, not highly-cultivated country. Here the third barrier—the first met with on the journey down the river, but the third from the sea-board on the return journey—is encountered; and here the united streams of the Wurdah and the Wyngunga have somewhat inconveniently received the local name of the Pranheeta, by which name the river is known until, as noticed above, it merges into the Godavery, a river better known, but less deserving of giving its name to the navigation works than the Wurdah. For whilst the Godavery beyond the junction is hopeless for navigation, the Wurdah is composed of a bouquet of streams, all more or less navigable, and all communicating with important cotton-growing tracts. From this point to Coconada—the port, or rather roadstead at the river's mouth—the only streams of any importance that are passed are the Indrawuttee and Sebree, both rising in the wild country of Bustar. Until the gorge through which the Godavery cuts its way through the Eastern Ghats on its road to the sea is passed, and the Madras Presidency is entered, the country, though picturesque, is sparsely populated, and is equally poor both in cultivation and traffic.

The affluents of the Wurdah.

131. During the rainy season, when the river and its affluents are full, part of the Godavery as far as Seroncha is navigable. From Seroncha upwards, the Wurdah during the rainy months is passable, and there is also some local boat traffic, to a limited extent, on the Wyngunga, the Pyngunga, and even on the Wunna—the Hingunghat River—during these months.

Boat traffic during the rains.

I say a part of the river, because, at certain points, its course, even in the fullest flood, is blocked by long parallel ranges of rocks, well known by the name of the "barriers" of the Godavery. Two of these barriers are met with near the junctions of the Wyngunga and the Indrawuttee with the main stream, at the points where the hills, which follow either bank, close in on the river. The barriers are indeed the rocky strata, the roots of the hills, laid bare by the action of the water on the soil which once covered them. For the present these rocks bar the navigation at three points, and, as the accompanying map will help to explain, the navigation of the river, even under the most favourable circumstances, is limited to the "reaches" lying between these several barriers. It was to remove these obstructions, and to admit of the cotton and other traffic of these Provinces enjoying the advantage of the river during certain months of the year, that the Godavery navigation scheme was planned.

The barriers of the Godavery.

132. It may be convenient here to give the distances of the chief points on the river, and as it is easier to go with the stream than to plod up against it, and as the chief traffic too will be towards the coast, the course from our cotton country to Coconada had perhaps better be adopted. Poolgaon, where the Great Indian Peninsula Railway crosses the Wurdah, is a good starting point. Even the most sanguine hardly expect to open the navigation much further inland. It is a place pretty well known to most who travel in these Provinces, and have anything to do with the cotton trade, and it is in the centre of the Wurdah cotton-growing country. Nagpore from this point is distant by railway 67 miles. The chief cotton-growing country of the Berars, the valley of the Poornah, lies about 50 miles to the west, stretching from Oomraotee to Mulkapore. From Poolgaon to Chanda by river is about 100 miles. The falls of the Wurdah, forming in themselves a somewhat formidable barrier, are encountered half way, and will have to be disposed of before the navigation to Hingunghat is complete, as the Wunna joins the Wurdah some few miles above the falls. Chanda from the head of the third barrier is distant about 50 miles, and this length, when there is any water in the river, may be called the fourth "reach" of the Godavery. The third barrier, where, as already noticed, we meet the Wyngunga (the same river that is crossed much nearer its source on the road between Seonee and Jubbulpore), is the largest and most troublesome of the whole three outcrops of rocks, being 35 miles in length. Then comes the third "reach" from the foot

Navigable portions of the river.


ERY.
Oomraottee
Wurdah
Yeotmul
Nandair
Nirmul
Godaver
HYDERA
Kistna River
Scale 96 Miles = 1 Inch.
100
150

of the third barrier to the head of the second barrier, a distance of 75 miles, during which the station of Seroncha, and the "*Sungum*," or junction of the Godavery with the Wurdah, are passed. Avoiding by a short land journey the second barrier, which is 14 miles in length, the second reach of the river is gained, which extends to a point 68 miles south, the head of the first barrier. The first barrier is 20 miles in length, but the works are now so well forward that this may now be struck out of the list of obstacles to the navigation. The head-quarters of the navigation works are situated here at Doomagoodium. From Bhudrachellum (at the foot of the barrier) Dhowlaishwarum is 98 miles. The gorge of the Godavery already alluded to is passed about half way, and the Central Provinces are left behind, and the Madras Presidency entered. Here the scenery is the grandest, the river regularly cutting its way through the range of hills which bars its passage to the sea. The gorge once passed, all is plain sailing, and the river here is navigable for the greater part of the year. From Dhowlaishwarum to the sea 35 miles remain, which are travelled over with the help of the Canal, the chief works of which are at Dhowlaishwarum itself. The total distance, then, from Poolgaon to the sea is 494 miles, and may be recapitulated thus :—

	Miles.
From Poolgaon to the head of the third barrier.....	150
The length of barrier	35
From foot of third barrier to head of second barrier	75
Length of second barrier.....	14
From foot of second barrier to head of first barrier	68
Length of first barrier to Bhudrachellum	20
From Bhudrachellum to Dhowlaishwarum	98
From Dhowlaishwarum to Coconada by canal.....	34
Total.....	494

133. The works, having for their object the removal of these impediments, have been under construction for some years past. It is proposed to carry the traffic round the barriers by means of canals: and each barrier is indeed a sort of natural *anicut*, throwing back the river and assisting the formation of a head-water for the canal. A considerable sum of money has already been spent on the work, and the difficulties with the first barrier have been surmounted. The two most formidable barriers

Progress of the works.

have yet to be taken in hand. The total cost of the work, from which, of course, the amount already spent would be deducted, is estimated at £500,000. The completion of the work would render the river navigable from the sea to Chanda during the rainy months.

134. I have thought it advisable that a short notice of these works should be introduced into this Report, because the name of the Godavery is generally associated with our cotton traffic, and because it is apparently supposed in some quarters that that traffic is utterly dependent on the Godavery, and that until the scheme be completed—and this cannot be for years—our cotton traffic will be but scantily provided for. How incorrect this view is, the foregoing paragraphs, in which it has been shown that the cotton is now carried by railway direct from the press-houses, erected in the centre of the chief cotton-growing districts, to the sea-board, will show. And most of those who are interested in our cotton trade will easily realize how little we are dependent on the Godavery for the carriage of the greater part of our cotton crop. Although it may be thought that much good is not to be gained by speculating here on the future—and the Godavery navigation, so far as our cotton is concerned, is likely to belong to that period—still it may not be uninteresting to notice here the effect the opening of the river is likely to have on Berar, our chief cotton field. On this point I may usefully quote the words of the late Chief Commissioner, Sir Richard Temple, recorded in a Report written in 1863, soon after he had made the Godavery tour. Among other, to us, less important conclusions, Sir Richard Temple expressed his opinion, that—

Our chief cotton traffic is independent of the Godavery scheme.

> "1*st*.—Under existing circumstances the project will not be of material importance to Berar.
>
> "2*nd*.—That its importance as regards Nagpore is diminished by the construction of the railway to Bombay. That its importance to Chutteesgurh will be diminished by the opening of the Mahanuddy route.
>
> "3*rd*.—That still, if the Godavery and Wurdah Rivers be opened for navigation to Hingunghat, in the Nagpore Province, the river route to Coconada will successfully compete with the railway route to Bombay for all the bulkier articles of traffic in the Nagpore country."

135. Now the Nagpore country supplies but one-fifth part of our cotton traffic. As for the Berar cotton, all that grown in the great cotton field about Oomraotee, Khangaon, Akote, would, before it reached the head of the navigation

Berar cotton always likely to affect the railway.

project, be obliged to undertake a land journey of from one hundred to one hundred and fifty miles. There are other and obvious objections, which it is hardly necessary to notice here, and I doubt of any arguments being adduced to prove that the Berar cotton will adopt this channel in preference to the now firmly established route by the railway to Bombay. The two routes may be likened to the voyage round the Cape and the overland journey. Although the former route now takes most of the cotton, the overland steamers are generally as fully loaded as they can possibly be. The trade has developed during the past few years as under:—

Statement showing the quantity of Cotton shipped Overland in the following years.

1865	44,737	bales.
1866	83,925	„
1867	116,405	„
1868	81,241	„
First six months of 1869	137,563	„

When the Suez Canal is open, the trade will most probably attain very much larger dimensions, and the tedious journey round the Cape will be avoided. On this point, I would quote the following extract from a report by the Chevalier Gumpert, the Consul for Austria and Northern Germany at Bombay, which shows how the overland trade with that port is on the increase:—

"For a series of years the British commerce, *viâ* Egypt, has steadily expanded, and it would appear that sailing vessels and the old route *viâ* the Cape are soon likely to be supplanted by steamers and the short route *viâ* Suez.

"One of our most respected shipbrokers writes on this point in his circular of 20th March, as follows:—

'An interesting question, however, remains for the future, *i. e.*, how to employ our fleet of sailing vessels? The whole commerce of this port (Bombay) is undergoing a complete revolution. The inquiry for freight in sailing vessels is suffering immensely through the continued and large shipments of cotton *overland;* and when once the Suez Canal is handed over to commerce, and our goods to all parts of Europe can be despatched without reshipment *en route*, it is to be expected that a large proportion of the produce now sent by the Cape will find its way to its destination per steamer *viâ* Suez, and the great question of the day then will be—the disposal of our large fleet of sailing vessels.'

"At present we have already a regular overland traffic, although goods have to be forwarded by rail through Egypt, to be trans-shipped at Suez and Alexandria (with a railway freight of about £2 6*s*. per ton against Canal transit dues of 10 francs per ton measurement).

"The steamers of both Companies receive on their passages to and fro, with scarcely any exception, as much freight as they can carry. To illustrate this I will take cotton, which is but one of many articles of export, although the most important, and in regard to this staple it may be mentioned that already a sixth ($\frac{1}{6}$) of the total exports of cotton of this last crop found its way to Europe by the overland route—and this quantity represents at least 20,000 bales per month.

"Manchester piece goods and yarns (the cheapest kind excepted), woollen and silk stuffs of all kinds, can be imported with the same advantage by the expensive overland route as by sailing vessel, and this traffic is certain to increase when the Suez Canal is opened, and the reduction in steam freight, which is likely to follow, takes place. With cotton at its present price it is immaterial to the Austrian cotton-spinner whether he receives it by sailing vessel, *viâ* Liverpool, at a freight of £2 10*s*. per ton, or overland, *viâ* Trieste, with a £5 freight.

* "*The tendency of commerce at the present time is to avoid all detours and agencies; in other words, to bring the manufacturer in direct communication with the foreign ports, which not only consume his manufactured articles, but furnish him with the raw materials, such as cotton, wool, and hemp, &c.*"

A low rate of freight is doubtless a great advantage, but with cotton at its present price, the delay in the long sea route, interest on money, insurance, &c., eats up much of the difference between the rates charged. It may, of course, be argued, that when the price of cotton falls the staple will not be so easily able to bear the present high rates of freight, and would then gladly take the water-carriage if available. But in answer to this, it might be advanced, with reference to the Godavery, that the effect of dangerous opposition in the form of water-carriage might induce the Railway Company to lower their rates, and that, apart from this consideration, if the Railway Company saw that their rates of carriage were so high as to be likely to damage the trade,

* The italics are mine.

the Directors, feeling that the cotton trade is indeed the goose which lays the golden eggs of their profits, would not be so unwise as to become parties to the destruction of a goose so valuable to their interests. In fact, should that day ever arrive, when the excellent cotton of the Berars cannot bear a moderate railway freight to Bombay, then the price offered for cotton will undoubtedly be so low as not to offer sufficient inducement to the people of this part of India to cultivate this crop in any quantity for export.

136. To some cotton however, although not to that of the tract to which this report chiefly refers, the navigation scheme when complete will be of importance, and to this crop the river, even in its present state, offers some advantages. On the right bank of the river, in the Nizam's country below Chanda, some excellent cotton is grown. Much of it is the "*jurree*," or cotton of the spring crop, which comes later into the market than the Berar cotton. Much of it now goes to Hingunghat. Bullock-loads of it may be seen late in the season streaming into the Oomraotee or Khangaon markets, having been carried for perhaps from 150 to 200 miles in this primitive pannier fashion through a somewhat wild country. The native spinners, too, intercept much of this cotton: it is so strong and even that it is admirably adapted for spinning fine yarn. Now the Godavery scheme might depend on securing most of this cotton. Even this year a European firm in Coconada has had its agency in this tract, and, notwithstanding the difficulties to be encountered, and the necessity of breaking bulk at the barriers, a considerable consignment has been sent down to Coconada by the Godavery route. The opening of the river would not only have the effect of securing for purchasers in return for piece goods a larger share of the crop, but might materially stimulate the cultivation of cotton and the production of the staple in that part of India.

Value of the Godavery to the Nizam's Country.

137. I regret to have again to report that the transfer to these Provinces of a share in the Bombay Cotton Fee Fund, its just claim to which will not readily be disputed, is still deferred. The extension to these Provinces of the Act in its old form has long since been recommended. The effect on our trade of the export duty levied on our cotton, in common with all that exported from Bombay, is that, even after deducting the contribution, which it might not unfairly be held should be paid by us towards keeping up the inspecting establishment at the port, the cotton of these Provinces,

Proposed transfer to these Provinces of a share of the Cotton Fee Fund of Bombay.

and indeed the cotton of many other parts of India, is heavily taxed for the inspection and improvement of the cotton grown in the several collectorates of the Bombay Presidency. And this tax has now been paid for several years. This year the 3 annas per bale was paid by upwards of 70,000 full-pressed bales of cotton sent from these Provinces, which did not even receive the benefit of the inspecting establishment at Bombay, the greater part of this cotton having been carried direct from the railway trucks to the shipping in the harbour. And the sum thus paid amounted to upwards of 13,000 Rupees, for which payment no counterbalancing advantage was received.

138. There has been, no doubt, some adulteration of cotton during the past season in these Provinces. As no agency exists to prevent these practices, it would be absurd to assume that there had not been some bad cotton, and a certain quantity of stones and seed and dirt, among the 275,000 bales sent down to Bombay; but, on the whole, it will be admitted that the crop was not a bad one, and that it went forward in good condition; that but a small proportion of the Oomraotee was rejected; and that the "Oomraotee" of the Bombay market means any cotton that comes up to a certain standard, whether grown in the Berars or not. Nor, perhaps, will it be advanced that the cotton purchased through European Agents was to found be adulterated. As our cotton pays handsomely towards the fund raised to provide an agency for the suppression of frauds, it is clearly desirable that a special establishment, defrayed by that fund, should be provided for our cotton districts. But, although I am sanguine that good will result from the careful and cautious action of the Inspectors in these Provinces, still it may fairly be hoped that, by degrees, the trade itself will succeed in putting a stop to practices which cannot but leave a stain on the character of our Indian cotton. In my last Report a belief was expressed that, if the producer could be brought into more direct communication with the consumer, the one would soon learn that the other requires a clean, sound cotton, and would also realize that in the long run it pays better to bring good cotton to market than bad. The *inducement* to adulterate being thus removed, a decrease in the practice might not unreasonably be expected. Although it has still many of the difficulties to deal with which a trade long in the hands of a certain class of natives is likely to offer, (and during the past season these difficulties have been severely felt,) the system of purchasing cotton through European

Adulteration of cotton during the past season.

agents in the interior is steadily progressing; the number of full-presses has increased; the facilities for transport are being perfected; and a Bombay merchant, if he requires pure Oomraotee cotton, can now without difficulty purchase it from a European agent in the interior, who will ascertain whether the loose bags in which the cultivator brings his cotton to market contain dirt or stones, and who will ensure the consignment reaching Bombay in good condition in neatly packed full-pressed bales. I believe if this system could be generally adopted, less would be heard of the adulteration of cotton. In fact, the system would amount to this—the European agents in the interior would act as a well-qualified, interested, and hence in every way most efficient, body of Inspectors. My views on this subject, such as they are, will be found expressed at some length in a correspondence with the Chamber of Commerce, Madras, given in Appendix **E** to this Report.

139. Any affection I may have evinced for half-pressed bales at a season when, in order to prevent the disastrous detention of cotton on the railway, some plan less inconvenient than that of packing the cotton in dokras was necessary, has, I confess, to a great extent been transferred to the improved system of full-pressing the cotton. I hope, indeed, in time to see the half-pressed bale as obsolete on the railway as the dokra now is, and that the excellent produce of our cotton lands may be so carefully packed before it leaves our Provinces, that the possibility of tampering with it may be reduced to a minimum. Nor am I in favour of the use of a half-press in the villages for the purpose of packing the cotton there before bringing it to market. As the ryot can already pile on to his cart as many "*dokras*" as his bullocks can drag, no object would be gained by *him*, as far as carriage is concerned, in using a half-pressed bale, and any such arrangement would be to be deplored, as removing the safeguard, which now exists in the markets, against adulteration—that safeguard being the facility of inspection. An up-country agent can search a loosely packed *dokra* through and through. The ryot knows this, and is aware that if he fills the centre of the bag with rubbish, the cotton will be paid for as rubbish, and he has thus no great inducement to spoil his good cotton. But remove that facility of inspection,—pack the cotton in half-pressed bales difficult-of-search,—and you afford that inducement to adulterate the cotton, and suggest and encourage fraud. The present system is, for all parties, as good as it can be, and I doubt whether either the Bombay merchant or the up-country agents would

Importance of full-pressing the cotton in the interior.

be in favour of any change in the manner in which the produce is now brought to market.

140. During the year I have done my best to fulfil the instructions of Government, which require that I should submit periodical reports containing information likely to be of interest to all connected with the cotton trade both in this country and in Europe. Besides these published reports, the number of references and inquiries I have to answer from all parts of India, and I may now fairly say from all parts of the world, is very great, and my correspondence has increased to an extent which is almost alarming, and which, with my constant absence on tour, requires some little management. I have also endeavoured to keep the Government informed of the views and requirements of the mercantile community; and if I have in any way succeeded in indicating to the one the direction in which assistance or attention is required, or convincing the other that the Government is really desirous of affording every legitimate countenance and help to the trade, I am confident it will be considered that I have performed no unimportant part of the duties of my appointment.

Periodical reports of the crop and exports submitted.

141. During the year under report the Octroi duty levied on cotton at the markets of the Wurdah Valley has been reduced. It is also, I understand, intended to remove the tax altogether on the expiration of the lease of the parties to whom its collection is now farmed out. If my views on the subject are correct, then the removal of this and all taxes and fees on our cotton are of no small importance to the trade. For each tax or charge on cotton is, in reality, a deduction from the sum which the cultivator would otherwise receive for his produce, and thus by the amount in question is a deduction from the inducement held out to the cultivator to grow and extend that crop. The Octroi tax certainly comes out of the pocket of the ryot. He pays it before he takes his cotton on to the market-ground. And, so far as I can see, he pays, or his cotton pays, all the charges from Hingunghat to the Manchester mill;—by which I mean that if the charges for freight, &c. between Hingunghat and Manchester were reduced, then, as matters at present stand, the ryot would reap the benefit of the change in a higher price for his cotton.

Reduction of the Octroi duty in the Central Provinces.

142. For, speaking generally, the cultivator who produces and sells the cotton at Hingunghat cannot in any way regulate the market price.

For this he is dependent on the home market and the many causes which combine to raise and lower the price in Liverpool. The ryot brings his cotton to market, and on the telegraphic notices from Europe the price which he receives for his crop almost entirely depends. It is true that it sometimes happens, in a local market, that speculators and others upset all calculations, and that the rates for a time run wild; but a very large proportion of the business is now happily transacted on commission, the manner of which is somewhat after this fashion. The price at home being, say, about ten pence, orders are sent out to India for so many thousands of bales, at about that rate, landed in Liverpool. The purchasers at Hingunghat, agents of firms in Bombay or at home, have to take into consideration all the charges which will have to be paid on the cotton between Hingunghat and Liverpool—the pressing charges, railway freight, the Bombay 3 annas on each bale, the insurance, ship freight, home commission, &c.; and deducting the total of these items from the "10*d.*," which is technically called their "limit," they have to calculate how much they can afford to give the ryot. Under ordinary circumstances, the home price, *minus* these charges, is the Wurdah market-rate. Now, as our cotton trade chiefly depends on the inducement that can be held out to the ryots to grow this crop, *i. e.*, on the balance given to the ryot for his cotton after deducting all charges from the home price, the importance of reducing these charges as much as possible, or, in other words, of increasing the inducement held out to the ryots to extend the cultivation of cotton, will be readily understood.

Importance of reducing all fees levied on cotton.

143. The question of the quantity and quality of "Waste Land" available for purchase is one of no inconsiderable importance to those interested in the extension of cotton cultivation in our Provinces. It appears, therefore, desirable that these annual Reports (which, as experience is gained, and as the requirements of the trade become more fully known, may, I hope, be so arranged as to convey much useful information) should contain some notice of the tracts in which arable land can be purchased on fee simple or obtained on clearance leases. Of this class of land, there is, as the abstract given in the following Statement will show, a large quantity available in the Central Provinces. And these tracts can be purchased on the terms detailed in the Rules given in Appendix G. These rules do not apply to Berar, which is foreign territory, and where, moreover, save

Waste lands available for purchase.

Statement (taken from the Administration Report of the Chief Commissioner) showing the Waste Lands available for sale in the Central Provinces.

Principal geographical divisions of territory in the Central Provinces.		Total area in square miles.				Unappropriated culturable waste, in acres.	Communications, mileage of.				
			Waste.					Made-roads.			
		Cultivated.	Culturable.	Unculturable.	Total.		Water—distinguishing navigable rivers and canals.	1st Class.	2nd Class.	3rd Class.	Railroads.
BRITISH POSSESSIONS.											
Trans-Nerbudda Districts	Saugor	1,006	1,770	1,229	4,005	442,391	.....	...	.....	...	.....
	Dumoh	654	681	1,122	2,457	460,857	.....	...	.....	6	.....
Nerbudda Valley Districts	Jubbulpore	1,132	1,633	1,496	4,261	286,346	.....	98	235	...	66
	Nursingpore	733	473	710	1,916	119,250	224(*a*)	...	.....	5*	.....
	Hoshungabad	1,390	893	2,019	4,302	1,024,790	150(*b*)	...	.....	498*	.....
	Nimar	496	1,004	1,200	2,700	864,832	.....	...	140	...	75
Sautpoora Hill Districts	Mundla	511	1,326	2,882	4,719	1,483,368	.....	...	.....	...	.....
	Balaghat	317	565	1,726	2,608	177,032	84(*c*)	...	.....	...	.....
	Seonee	1,033	794	1,781	3,608	666,001	.....	90	.....	...	.....
	Chindwarra	947	664	2,241	3,852	468,145	120(*d*)	...	46	70	.....
	Baitool	1,040	1,359	1,719	4,118	613,031	.....	...	95	138	.....
Nagpore Plain Districts, in valleys of Wurdah and Wyngunga.	Nagpore	1,692	867	1,175	3,734	89,743	.....	57	117	33	21
	Bhundara	1,281	1,132	1,509	3,922	330,061	232(*e*)	...	58	...	.....
	Chanda	1,089	5,267	3,644	10,000	750,135	194(*f*)	...	47	...	.....
	Wurdah	1,301	520	558	2,379	109,019	.....	...	74	...	47
Chutteesgurh Districts.	Raepore	1,600	6,598	2,845	11,043	875,238	.....	...	26	...	.....
	Belaspore	1,892	2,217	3,021	7,130	435,429	25(*g*)	...	.....	...	.....
Sumbulpore District, on the Mahanuddy		2,520	1,080	600	4,200	.....	90(*g*)	...	.....	...	.....
Upper Godavery District		74	785	1,067	1,926	339,391	395(*h*)	...	.....	...	.....
Total British		20,708	29,628	32,544	82,860	9,535,059	1,514	245	838	750	209
								1,833			

NOTE.—(Native States not included)

(*a*) During rains by Nerbudda, Shere, Doodhye, and Shukur. (*b*) During rains by Nerbudda, Towa, Denwa, and Gunjal. (*c*) By Bungunga, Bagh, Deo, and Sone. (*d*) By Pench and Kunhan. (*e*) By Wyngunga, Baghnuddy, and Choolbund, during the rains. (*f*) By Wyngunga and Wurdah Rivers during certain seasons. (*g*) By Mahanuddy. (*h*) By Godavery and Pranheta. * Not yet opened.

perhaps in the Woon District, parts of which, as explained in paragraph 15, have been taken in hand by the Brinjarahs, the proportion of uncultivated to cultivated land is, comparatively speaking, small. Any attempt to describe the various characteristics of the waste tracts of the Central Provinces could fill a good-sized Report, but I hope that the accompanying sketch map, together with the other maps of this Report, in which the existing communications and the chief products of those Provinces are shown, will indicate roughly the most promising localities. It will be sufficient here to notice that the quantity of culturable waste land available for sale or on clearance lease amounts to nearly ten millions of acres, or nearly fourteen times the area of the existing cotton cultivation. In some few instances the waste plots are situated within an easy distance of the Railway line; *e. g.*, in the Nagpore, Wurdah, and Nerbudda Valley Districts. Some years ago, my friends, the Brethren of the Order of St. François de Sales, purchased, on my recommendation, an estate situated within six miles of the railway station of Boree, in the Nagpore District, which has turned out a successful venture. The average price of the waste land sold during the last few years was between 4*s*. and 5*s*. per acre. Registers containing full information of the tracts available for sale, and illustrated by maps, have been prepared in all the Districts in which the survey has been completed, and it will afford me much pleasure to answer any inquiries which gentlemen interested in this subject may desire to make. A specimen of the class of information available, taken from one of the detailed Registers above referred to, will be found in Appendix **H**. The description of the physical characteristics of these tracts, taken from the last Administration Report of Mr. Morris, the Chief Commissioner, gives so perfect a description of the general features of the country in which the waste lands are situated, that I have, with the Chief Commissioner's permission, included this information in Appendix **F**.

SECTION VI.

SLIGHT SKETCH OF THE PRESENT POSITION OF THE COTTON TRADE.

144. The future of Indian cotton so much depends on the power and willingness of the home and continental manufacturers to take our produce, and on the competition of other producing countries, that my attention during the year has been directed, not only to the cotton trade of India, but also to that of other parts of the world. As these questions cannot fail to be of some interest to all who are in any way connected with Indian cotton, I think I may be excused, if I string together here some of my notes,* with a few paragraphs of explanation, and attempt to give a slight sketch of the demand for cotton in the different parts of the world, the share borne by India in supplying that demand, the satisfactory position which India has now attained in this great trade, and the reasons for hoping that this position may for the future be firmly maintained. At the close of this slight and imperfect sketch† will also be found a notice of the chief customers for the yarn and cloth on whom the manufacture, and hence the demand

Slight sketch of the cotton trade.

* The figures are chiefly taken from the published circulars of the Lancashire trade, the statistics of the Board of Trade, &c. given in the *Cotton Supply Reporter*, and other authorities quoted. The figures of the exports of piece goods and yarn are from the *Economist*.

† I trust that those who have taken the trouble to wade thus far through this Report will make some allowance for the disadvantages under which this attempt to procure and string together some details bearing on our cotton trade has been undertaken. The difficulty I have experienced in obtaining even these figures, and the differences noticeable in some of the estimates that I have succeeded in procuring, have enabled me to realize pretty fully the incompleteness of the information here offered. If, however, it shall be considered that although in some cases the figures may be inaccurate, still that the general outline of the sketch indicates the class of information which, if presented in a less unreliable form, would be of real use to the trade, I am confident that the Government will be but too glad to meet the views of the mercantile community, and to ensure the required information being collected and arranged in the most complete form. For all criticism of the arrangement, and of the figures of this sketch, I shall be very grateful, as I am sanguine that all such criticism will suggest many improvements, and help to correct many inaccuracies into which, from my want of knowledge and materials, I have fallen. I shall be extremely thankful for any hints regarding the best sources from which information of the description required for this Report can be drawn; and I hope that it will be borne in mind, that my acquaintance with commercial circulars and other sources of information is, as yet, very limited, and that I shall be very glad to receive copies of all papers which are likely to assist me in my inquiries. If those who take an interest in the supply of Indian cotton will kindly assist with suggestions, and will point out the mistakes and omissions in the rough

for the raw material must chiefly depend, together with a Statement of the distribution of British manufactured cotton goods over the different quarters of the globe.

145. My chief object in making this by-no-means-easy attempt to give a rough idea of the cotton trade, is to try and reassure those who have taken unnecessary alarm at an idea that the present endeavours to improve and extend the cultivation of cotton in India are likely to end in disappointment and loss to the native cultivator. "Presure," I have heard it asserted, "is being put on to meet the cry of Manchester, and Manchester will be only too glad to seize the first opportunity of leaving India in the lurch." If Manchester can succeed in getting elsewhere a cotton which will serve her purpose better than that which we can supply, it may be a question whether she could with justice be blamed for purchasing the material in the best market! It cannot be denied that, to most of us out in India, whether we be officers ruling over Districts, or connected with the Cotton Department, it is indeed a gladsome duty to assist in the improvement of the cultivation of cotton, and to feel that, by so doing, we are helping to supply a great want of many starving countrymen at home. But I do most distinctly deny that any such attempt is made at the cost of the people of India, with whom we are officially connected, and whose interests it is our first duty to consider and protect. I entirely doubt any measure, however beneficial it might be to Lancashire, being forced on the native cultivator to his prejudice and loss. For, in the first place, even if there could be found those who were willing to attempt to mislead them into growing cotton, the people in this part of the country would not give way to any such pressure, any more than they would, at the present moment, yield to any attempt to prevent the cultivation of this extremely popular and remunerative crop. Whatever they may have been in former days, the people are now, thanks to a succession of rich cotton harvests, very well off and remarkably independent: and this good turn they certainly owe to Lancashire, which, as yet, at least, has not done them the fatal injury which in some quarters appears to be apprehended. The only pressure which has now any effect on the peasant of Berar, is the incidence of the remunerative price offered by the cotton market for his crop, and by the rise and fall of which price

Object of including this imperfect sketch in this Report.

Erroneous idea that endeavours to improve the cultivation of cotton is prejudicial to the interests of the native cultivator.

estimates here given, I can at least promise to spare no pains in procuring further information; and I am sanguine that, with such assistance, the similar sketch, which I hope to be able to present with my next annual Report, will be found to be less inaccurate and incomplete than this first tentative notice must of necessity be.

the annual supply of cotton in this part of India is visibly affected. It will scarcely be denied that, so far as matters have as yet gone, the bargain has been a perfectly fair one, and that, if we have helped to supply the mills of Lancashire, the benefit to the Indian cultivator by the trade has been not inconsiderable.* Feeling that the stability of this

---

* That great benefits have accrued, during the past few years, to the cultivators of Central India from the cotton trade will not readily be disputed. The following figures taken from the *Economist*, of the bullion shipped from Great Britain to Bombay from the years 1861—1868 inclusive, to make up the balance due to Western India, after allowing for the value of piece goods and other imports, are somewhat eloquent, and it is known that a fair share of this large sum found its way to the Poornah and Wurdah Valleys in exchange for cotton purchased at a never-before-known price.

Exports of Gold and Silver from the United Kingdom to Bombay during the undermentioned years.

	£		£
1861	5,456,000	1865	5,895,000
1862	8,848,000	1866	4,228,000
1863	10,618,000	1867	1,094,000
1864	10,113,000	1868	2,483,000
		Total of 8 years	£ 48,735,000

As I mixed very freely with the people at that time, being engaged in making the land revenue settlement of the Wurdah Valley (the Hingunghat and Chanda country), I had many opportunities of watching the effect wrought by the high price of cotton during 1863 and following years. A history of the events of that time in Central India would fill a good-sized volume, but it will suffice here to touch briefly on this subject; for including which in this already lengthy report, I make no excuse, as I am confident that any one who has waded thus far through so many paragraphs, must have in Indian cotton an interest sufficiently strong to bear even the imposition of these further heavy details.

The most beneficial effect of the rise in prices was the general squaring of accounts, and the consequent emancipation of the cultivator and his crop from the grasp of the village money-lender. Since the palmy days, when the price of "*Fair Dhollera*" touched 25*d.* the pound, many of the cultivators have, doubtless, relapsed into the chronic state of indebtedness, which characterised their position during former years, and much of the cotton crop is again in the hands of the money-lender, long before it sees the cotton market. The people were in many cases recklessly extravagant. The money which had come so easily, went equally easily. As cotton had risen in price from Rs. 10 to Rs. 100 the *bhojáh*, the excited Koonbie cultivator did not quite see why it should not rise to even 1,000 Rupees the *bhojáh*, and there was just a hope that perhaps it might not stop even there.

All sorts of absurdities were committed. Silver ploughshares, and tires of solid silver for cart-wheels, made their appearance here and there. Fancy prices were paid for bullocks of a favourite colour, or possessing some peculiarity of tail. Enormous sums were squandered on marriage ceremonies, and we may rest assured that the Brahmins did not omit to profit by the occasion! All these extravagancies tempted many to defer the settling-day with their creditors, a day which the *Mahajun*, or village banker, who

trade is of importance to both the Indian cultivator and the home manufacturer, many Government officers have done, and are doing, their best

---

regarded the creditor Koonbie as a valuable milch-cow, was not in the least unwilling to see postponed. And there is unfortunately a grim truth, in what has more than once been said of the native cultivator, that he is seldom so self-satisfied as when he has a heavy balance at his bankers on the wrong side of the account. The amount of his debt to the village Mahajun is, indeed, the gauge of the cultivator's respectability; it represents the sum which the Mahajun believes he can recover from his creditor without much difficulty; and perhaps few are better qualified to assess what each ryot is worth than the resident money-lender himself. In the eyes of the village community there is no disgrace in a man being in debt; on the contrary, to be well in the Mahajun's books is considered rather the thing: it is not every one who can compass it: the poorer classes could not get deep into the books, however persistently they might try. And any future scheme for the distribution of the suffrage might not incorrectly be framed on the basis of the amount that each person owes to the village banker. Hence many have remained in, or have again fallen into, the hands of their creditors, and, unfortunately, suits against cultivators, resulting in the sale of valuable holdings, have not been unknown during the last few years.

Still, after having looked at the worst side of the picture, a very large balance of substantial benefit remains. The cultivators, who, rendered enthusiastic by rich harvests, thought to gratify the bountiful Mother Earth, by scratching her back with a plough of silver, were the exception, and many had the good sense to feel that the cooling shade of mangoe-groves, and other trees planted in hundreds throughout the country, and newly dug wells, with a plentiful supply of water to refresh the soil during the hot months, would be more highly appreciated by the parched and overworked earth, than any arrangement which gratitude for plentiful harvests and high prices could suggest. Thus the number of trees planted greatly increased, the irrigated area was extended, and much land lying waste was brought under cultivation. The people indulged in better food and richer cloths, and the demand for the rich "*Dhotees*" and "*Sarees*" of Nagpore (the loin-cloths and plaids, the chief costume of the men and women respectively) increased; and, as an old conservative Deshpandia, when dilating to me on the objectional turn matters had taken, expressed it, "every cooly (or labourer) took to dressing himself like a Brahmin!" Earthen vessels disappeared before pots and pans of brass and copper, or of even richer metal; sturdy plough-cattle were imported in considerable quantities from all parts of India; the dwelling-houses of the people were improved; and, in many cases, mud and thatch gave way before substantial buildings of brick and stone.

Even the reckless extravagance of the Koonbies had the advantage of keeping much of the money above ground and ensuring its circulation, so that it reached to even the lowest classes, who benefitted largely by the liberality of the enriched Koonbies. But, allowing for the sums thus expended, a very considerable share of the millions of hard cash and bullion which found their way from Bombay to our cotton districts yet remains to be accounted for. Doubtless very large sums are still in deposit, in what the people consider the safest of all banks, that of the Earth. In the present state of native society in the interior of the country this is not to be wondered at, and perhaps it is not to be regretted that the appetite for speculation was not stimulated, and that the cotton profits of our cultivators were not engulphed in Back-Bay, or in some of the Financial Projects of the time. The purchases of gold in the districts were immense. Many of the rupees paid to the Koonbie at the market for his cotton found

to cause that great motive power,—a remunerative price,—to be more powerfully felt, by making the pressure more direct, and by removing the

their way to the goldsmith's at night, and were exchanged for bar gold, which was there shaped into bangles, and welded on to his arm. The number and thickness of these bracelets varied with the circumstances of the season. A good crop, and continued high prices, would be represented by a second bangle; the death of a plough-bullock, or so, from disease, or by a tiger, would necessitate one of the bangles going to the melting-pot; or a piece would be cut off from one end of the bracelet (after the manner of the gold chain of old, of which the Baron of the period is represented as breaking off a link, or so, as occasion may require), and the once massive bangle is hammered out into a lighter circlet, and replaced on the Koonbie's arm. The ladies of the household, too, came in for jewellery in great quantities, which seldom sees the light, save when a bad season, and consequent financial pressure, brings their ornaments into the market, and gold is at a discount throughout the country-side.

Of other and more important changes, which the great increase of wealth must be slowly but steadily working, an idea cannot easily be formed, consequent on the great difficulty experienced at all times in penetrating to any depth beneath the surface of native society. But occasionally little incidents crop up, which indicate the influences at work below, and show that the great flood of silver that swept over the cotton districts has levelled many of the social land-marks by which the different classes were long separated and distinguished. Village life is somewhat wanting in incident, and, save at a festival like the Paola, when the precedence in the procession of the headman's and the several cultivator's bullocks is a matter of as great anxiety and difficulty as official precedence at the grandest of great dinners, or during the all-exciting marriage season, everything is quiet and common-place. But the marriage season brings out everyone, and every single thing in the way of custom, privilege, position, and wealth that possibly can be paraded. A marriage is quite *the* great event in a villager's family, and the amount of money that has been spent on such ceremonies in the cotton districts during the last few years must have been enormous. The whole country-side, and the cattle which bring the cart-loads of visitors to the festival, are fed for days at the expense of the giver of the entertainment. Rich cloths are given away in all directions; bands, dispensing somewhat peculiar music, are collected from the neighbouring towns and paid at high rates, and all sorts of extravagancies are committed.

During the marriage procession and subsequent ceremonies, custom has fixed many points for observance by the various castes and classes in the village society. These distinctions were perhaps originally suggested by the limit which the means of each class prescribed, and if, at a Koonbie wedding, the bride and bridegroom were not paraded about on Elephants, it was because the arrangement was somewhat beyond the means of the poor Koonbie; and a less expensive means of carriage was adopted, on the same principle that, at home, some start on their honeymoon in a fly, whilst others affect a chariot and four. But, in course of time, each separate detail came to be a matter of privilege, and each class jealously guarded every advantage that had been secured over the other, and prevented the class below partaking of what they considered their exclusive rights. Now, however, the wealth and independence which the last few years have introduced have been accompanied by a tendency to "level up," and, in the matter of privileges at marriage ceremonies, the lower classes have gained several points, which, in old days, could not have been successfully carried in the face of custom, and prejudice, and caste. These points, slight though they may appear to be, are not without interest, as the surface ripples, indicating the perhaps not inconsiderable commotion which is taking

obstacles which at many stages break and reduce its force. If in the foregoing sections I have sufficiently explained myself, it will be seen

---

place below at a depth to which we are as yet unable to fathom. Thus, as my grumbling old friend the Deshpandia (a Brahmin of course) informed me, things have come to such a pass, that the enriched Koonbies ape their betters in most respects, and the whole style of a Koonbie wedding now-a-days is very different from what *he* could remember it. But then the Koonbies *can* boast of belonging to a caste, though perhaps that caste is at the bottom of the list, and *their* vagaries and impertinences might perhaps be tolerated. But what is to be said for those classes who can lay claim to no caste at all, not even the lowest caste—out-castes in fact,—the Chumars, Dhêrs, and people of that stamp, who have managed to stop many of the rupees that have been in circulation during the last few years, and who, what with the help of the railway, and one thing and another, are getting somewhat knowing and independent, and are not inclined to remain any longer in the subdued state which caste and custom have been kind enough to prescribe for them? One amusing case, bearing on the subject, came under my own observation, and as a straw which indicates the direction the wind is taking is perhaps worth recording.

During the hot weather of 1867, when I was in camp in the country north of Oomraotee, the stronghold of the "*Mallees*," or class of cultivators from whom our gardeners are chiefly drawn, and who are noted for the skill with which they manage their small irrigated patches, rich in flowers (a very paying crop, now that the well-to-do peasantry use flowers plentifully at all religious ceremonies) and garden produce, the Mallees waited upon me in a body, and begged me to exercise the general authority with which they suppose every European officer to be invested, and to punish severely the Chumars, or leather-dressers, who were represented to be misconducting themselves in a manner altogether intolerable. The charge against the offenders was this: The whole body of Chumars throughout the country-side had struck work, and had refused to make the Mallees any shoes, or to repair the "*motes*" or leather buckets with which in this part of the country the water is drawn from the wells for irrigation. Now the inconvenience of having to go without new shoes could be borne for a time, but the affair of the buckets was much more serious. The weather was hot, the crops were gasping for want of water. Even attempts to get Chumars from a distance to mend the leaking buckets had failed, for the trade's-strike of the Chumars against the Mallees was general, and extended throughout the country-side even up to Nagpore, it was said. As for the Mallees mending the buckets themselves, *that* was quite out of the question. In the first place, bucket-mending was not an accomplishment of which the Mallees could boast, and even had they possessed the necessary skill, the loss of caste which would have been entailed by any attempt to do "Chumars work" would have put the idea quite out of the question. And the cause of the pretty little quarrel was this: A short time previously, at the commencement of the marriage-season, some of the Chumars who were very well off, and who had become from various causes somewhat pushing and independent, had come with money in their hands to the Mallees, and begged them to supply flowers for the chaplets and garlands with which the bride and bridegroom at a marriage ceremony are bedecked. Now the Chumars, who skin and cut up dead animals, and perform other objectionable duties, are considered such utter outcastes, that, according to village custom, they were never permitted to use *real* flowers at marriage festivals, garlands and chaplets of *paper* being substituted in the place of the real flowers, which were thus spared the pollution which contact with anything so unclean as a Chumar would necessarily entail! The indignation of the Mallees may then be imagined when the Chumars, after having put up with the imitation article for many

that endeavours are now being made to effect this object by smoothing the way for the trade in the interior, and by reducing the cost and difficulties

hundreds of years, had the impertinence to come and ask for real flowers for their chaplets and garlands! Although the Chumars offered to pay almost any price (for there was no lack of money), the Mallees indignantly refused to part with a single flower. It was not the price, it was the principle that would be involved in thus encouraging these outcastes. So the Chumars went away discomfited, apparently. But they awaited their opportunity; and when a few days later the Mallees propounded the annual question of the repair of the buckets, the Chumars, by way of returning the compliment paid to them on the recent occasion, intimated that unless the Mallees brought out the flowers it would be a long time before the wells could be worked, as they were determined not to repair a single bucket until the flowers required by them were supplied. Of course, in a matter so important, the Mallees held out for a time, and their crops were beginning to show signs of suffering when I came amongst them. I fear that my conservative friends did not get much sympathy from me. I had not the authority, even if I had possessed the inclination, to interfere. But a few days later, before I left that part of the country, I saw the wells at work, and I knew that the Mallees had had to give in, and that the Chumar bride and bridegroom were being paraded about decked with garlands and chaplets of *real* flowers, and that the outcastes had gained a point which they are not soon likely to relinquish.

And this was only one of the many struggles for "position," which that season saw in the cotton districts. The barbers fell out with the carpenters regarding the manufacture of some wooden distinction, to which the barber bride and bridegroom were not, according to village tradition, entitled. And not a single carpenter in that part of the Berars could get shaved until the barbers carried their point. Perhaps the most amusing incident of all was what happened two seasons running with regard to the Dhêrs (Mahars) and the Mhangs, outcastes in the very lowest depths of the same class, yet between whom some slight division is recognised, the Mahar or Dhêr having the precedence! So low were the Dhêrs in the social scale, that, when a marriage took place among them, the bride and bridegroom were not permitted to indulge in any more dignified mode of conveyance than bullocks, seated on the backs of which they appeared in the procession. Now a Dhêr who, thanks to cotton, had acquired a little money, conceived the idea, when arranging for his daughter's marriage, of having a pair of ponies to carry the bride and bridegroom on the occasion. This soon got wind: the villagers immediately showed their determination to resist any such attempt at breaking through village custom, and on the appointed day they turned out in a body to thrash the pair and their relations. The matter was reported to the Magistrate, who ruled that, if the Dhêr could afford the arrangement, no one had any right to interfere with the procession. The excitement in the meantime continued intense, and when the matter was settled, and the procession did come off, it was considered, I believe, necessary to move some police to the spot to prevent a breach of the peace taking place. The people, however, who in this part of the country are exceedingly quiet and well-behaved, had the good sense to respect authority, and every thing went off quietly. The best part of the story has yet to be told. The following season the Mhangs, who, as noticed above, are but one remove below the Mahars or Dhêrs, having seen their brethren carry their point in the previous year, bethought themselves of adopting the same arrangements, and ponies for the bride and bridegroom were again to the front. But this time the procession did not come off so quietly, the Mahars turned out *en masse*, and the Mhangs paid dearly for their presumption, the bridegroom and all the party receiving very rough treatment at the hands of the now indignant Mahars. In fact, the out-caste

of the transport of cotton to the port of shipment, and thereby securing for the cultivator a larger share than he has hitherto obtained of the price

Mahars, having been promoted to the Upper House, had become staunch conservatives, and were prepared to resent and resist any attempt by such low creatures as the Mhangs to share in the privileges which they had with some difficulty secured for themselves, for the first time, in the previous year.

One more story, well known in the Berars, but which, for that reason, will not be any the less interesting to those who do not enjoy the privilege of spending much of their time in that part of India, and enough will perhaps have been said to show that the cotton trade has helped to improve the position of many among the lower classes, and to render them more independent and promising. Some time ago, a European officer, when on tour in the districts, received a message that a Dhêr, one of the lowest of outcastes, desired the honour of a formal interview with him. Now, as will be explained below, the idea of such a low creature as a Dhêr craving an interview with an officer was considered somewhat original. But the Dhêr had, in one way and another, made a considerable sum of money, and was a well-to-do man, and the Magistrate had no hesitation in granting the request for an interview. Early the next morning, before the hour appointed for the interview, the servant of the Dhêr made his appearance, bearing a tray covered with a cloth, which was supposed to contain the usual "*dallee*" of native sweetmeats and trash, which a native gentleman generally sends for an officer's acceptance before making his formal visit. Orders were given to make over the "*dallee*" to the servants, who alone are capable of digesting the trash of which these offerings are generally composed; but, on the tray being uncovered, it was found to contain the following assortment:—

2 bottles of brandy,
4 bottles of soda water,
1 bottle of pickles, and 1 tin of sardines,

which the enlightened Dhêr had bethought himself would be more congenial to the tastes of my friend than the usual array of native sweetmeats! Although the proportion of brandy to soda-water may be considered by some to have been somewhat liberal, still the Dhêr will perhaps be credited with some merit for his intelligence, and for striking out for himself a new line in the matter of presentation "*dallees*." But the most interesting point in his visit can only be seen by the help of the light of what the position of this class was at only a comparatively recent period. Mr. Lionel Ashburner, to whom I was telling this story last month, assured me that so miserable was the position of the wretched Dhêrs some years ago, when he was serving in Guzerat, that, if a Dhêr had the audacity to appear in public, he was obliged to drag behind him a bramble-bush to wipe out the trace of his obnoxious footsteps!—to go about, in fact, like the conventional mad dog with a tin-kettle tied to his tail!

Dr. Murray Mitchell, too, has recently reminded me, *à propos* of this class, that they were never permitted to live within the mud-walls, which, in old days, surrounded each village, but which rain, civilization, and Sanitary Commissioners are now fast "levelling down." The Dhêrs and Mhangs formed a small colony without these walls; and at Poona, in the Peishwa's time, there was a strict order prohibiting these outcastes showing themselves within the city before 9 o'clock in the morning, and later than 4 in the afternoon, so as to preclude on the "may-your-shadow-never-grow-longer principle," the possibility of the feelings of the respectable citizens of the place being outraged by even the shadow of a class so obnoxious falling across their path! In parts of the Central Provinces in which I have travelled, the Dhêr, if he meets a European

paid in Manchester for his crop. As it is hoped that, if cotton of an improved quality can be produced, without extra expense or labour, the gain to the cultivator will be great, and the position of his produce in the market will be secured against the competition of other cottons, various measures, the expenses of which do not fall on the cultivator, are being adopted by Government to improve the cultivation, in the belief that the stability of the trade, and the improved condition of the cultivator resulting therefrom, will eventually more than repay the present outlay. Thus endeavours are being made to supply the ryot with superior seed, which, with the same amount of care bestowed on it as that which now falls to the share of the ordinary cotton, will, it is believed, yield him a crop commanding a better price in the market. Inexpensive measures for increasing the out-turn of cotton per acre, by a system of irrigation and manuring, are being tried, and all these, if they succeed, will directly benefit the ryot, whilst, at the same time, they will, it is hoped, be not without their advantage to the trade of India and England. So soon as the inducement supplied by a remunerative price is withdrawn, the cultivation of cotton will undoubtedly fall off, as it has on more than one occasion threatened to do. All that is now being done is to try and render that inducement, which benefits both interests, permanent, by raising both the quantity and quality of our cotton supply to a position which will enable it to compete successfully with the produce of other countries. If we cannot succeed in doing this, the cultivator, who has sunk no extra capital in sowing his fields with cotton, will take to growing some other crop, and as cotton is an annual, the re-arrangement can be effected at the close of the first season which predicts the failure of the Indian cotton trade. I hope, for the sake of both the ryot, and the many spinners who have borne testimony to the excellence of our produce, that that day may be far distant; but if that day should ever

---

officer, or a Native of any position, salutes by first rubbing his nose in the ground, and then standing on one leg, holding his shoes in his hand the while, intimating that in "the presence" he cannot think of standing in a comfortable position or putting on his shoes even by the road-side! And until recently, in some parts of India, a Dhêr, if he had to give evidence in a case before a Native Magistrate, was not permitted to come within the Court-house, but had to stand outside, and shout out what he had to say from a distance.

A recent attempt to educate some young Dhêrs, by admitting them to one of the Government schools, was followed by the Brahmin pupils leaving the school *en masse*. Like the Mallees, however, of the previous story, the Brahmins soon came to their senses, and the despised Dhêrs and the Brahmins now read in the same school. The objection to travelling in a railway carriage with this class of people has long since been overcome, and it is to be doubted whether even the most orthodox Brahmin, if he was not very well off, would think of paying second-class fare to escape from the company of a Dhêr travelling in a third-class carriage!

come, the ryot, when he carries down to his field his bundle of seed for a grain or oil-seed crop, instead of the cotton seed which has for long held its place, will perhaps make the following reflections—that it is a great nuisance having to forego cotton, as it always proved itself a very easily-managed and well-behaved crop; that, now that cotton is no more, the excitement of the annual visit to the cotton market, and the good-natured telegrams which sometimes enabled him to secure Rs. 20 more for his "*bhojáh*" than that which his neighbours in the village, who sold their cotton early in the season, had realised, will be greatly missed. And, as he thinks tenderly of the valuable ornaments entrusted to his wife, or to Mother Earth, and of the silver bangle welded on to his arm, he will admit that cotton was indeed a good friend to him, and that, to say the least of it, it is perhaps well that the field, which has now to be put down with oil-seeds, has had a long rest from that troublesome and exhausting crop during the occupation of the accommodating and easy-going cotton. And I altogether doubt his attributing the falling off in the price and trade to the deliberate villany of Manchester.

146. There is yet another point which I am anxious to notice in this somewhat lengthy introduction to a sketch of the trade, and that is, that even if this Manchester is, as some would wish to believe, ever scheming to undermine and destroy us, the Indian cotton trade is, after all, not altogether dependent on Manchester for its existence. I hope that the figures of the following chapter will show that, even should Manchester inhumanly desert us, a market will yet be found for much Indian cotton in China and on the Continent of Europe. Indian cotton, if short in staple, is comparatively cheaper than many other cottons, and is not ill-adapted to the requirements of the Continental spinners. In regard to China our position is favourable; and, as regards the Continent, the opening of the Suez Canal, and the gradual extension of direct communication with Southern Europe, will benefit our trade and help to break the shock of any sudden desertion on the part of Manchester. An increased supply of American cotton would doubtless affect the demand for our produce on the Continent also, but looking to the increase in the manufacturing power of foreign countries, and the improvement in the means of communication between India and the Mediterranean, our cotton will, it may be hoped, compete with that of America at a less disadvantage than formerly, and we shall not easily be ousted from the Continental market. If, then, we persevere in our attempts to improve and extend our cotton cultivation, our position, taking even a somewhat gloomy and not altogether justifiable view of it, would, at the worst, be this:—If our countrymen require our produce we shall be able to supply it to them in plenty; if they

are able to obtain better and cheaper supplies elsewhere (and, remember, our endeavours all tend to reduce the probability of this result), then we may rely on the Continental spinners and other customers to break our fall, and to purchase a large portion of our surplus produce.

147. To give a rough idea of the consumption of the world, it will perhaps be sufficient to give here the figures of 1868, which may be accepted as representing the demand for the raw material as it at present stands and as, with perhaps a slight increase, it may be expected to continue for some years to come. At the head of the list of the consumers is, of course, Great Britain. The latest figures I can procure show that the spindle power of our Island has now reached the enormous figure of 34,215,345 spindles.* The actual consumption of Great Britain for the year 1868 was—in bales each containing 400 lbs. of cotton nett (to which standard all my calculations have been reduced†)—2,490,000 bales, or 47,890 bales weekly. This does not, however, represent correctly the quantity of cotton that could have been worked up if a larger supply of cheap cotton had been forthcoming. "For," say Messrs. Ellison and Hayward in their valuable

Figures of the year 1868 adopted.

* Since this was in type I have received the following figures through the courtesy of the Secretary to the Board of Trade :—

Description of Factory.	Year.	No. of Factories.	Spindles, including double spindles.	Power Looms.	Motive Horse Power.		Total number of persons employed.
					Steam.	Water.	
Cotton.	1868	2,549	34,215,345	379,329	191,033	10,029	401,064

† The necessity, in order to convey a correct idea of the cotton trade, of reducing the "bales" or packages of cotton in which the exports are generally represented, to a standard bale, instead of talking generally of "bales," will be understood when it is explained that a "bale" means anything from 500 lbs. to 150 lbs. of cotton, the average weights of the bales imported into Great Britain during the year 1868 having been, according to the *Economist*, as follows :—

	Quantity of cleaned cotton contained in each bale.
American	443 lbs.
Bombay	380 „
Madras	300 „
Bengal	300 „
Egypt	500 „
Brazil	150 „
Turkey, &c.	380 „
West Indies, &c.	180 „

Report, "the consumption of 1868 represents only 84 per cent. of "full time, or (say) five days a week; to give "full employment to the spindles now in exist- "ence, we should require fully 57,000 bales of "400 lbs. per week. The present rate of consumption is probably not "more than 50,000 bales of 353 lbs. (or 44,125 of the standard bales of 400 "lbs.) per week, or rather more than three-fourths of the quantity required "to keep the whole of the existing spindles fully going. In other words, "the mills at present are working *on the average* only just over 4½ days per "week. We say *on the average*, because some mills are closed altogether, "while the working time of others varies between three and six days per "week." Thus, then, Great Britain consumed last year 2,490,000 bales, and could have consumed 2,964,000 bales; or, speaking in round numbers, nearly 3 millions of bales of 400 lbs. are annually required to save the manufacturing districts from distress.

Actual consumption of Great Britain.

Quantity required by the Lancashire trade.

148. Although, as a consuming country, Great Britain is far ahead of every Power in the world, still continental Europe, even if it is not a dangerous rival to us in supplying other quarters of the globe with cotton goods, is now making arrangements for clothing its own population, formerly dependent on our manufactories for piece goods and yarn. It is doubtless extremely questionable whether, with the advantages possessed by Great Britain of iron and coal, and skilled mechanical labour, and a sea-board facilitating all commercial operations, the Continent can ever prove to us a very formidable opponent. But the following figures will show that the quantity of cotton taken by the manufactories of France and Germany, Holland and Russia, and even by Italy and Spain, is in the aggregate very considerable; and as the cotton supply of the world is at present somewhat limited, it will be understood that the more the demand for the raw material for the Continental mills increases, the more this competition must affect the purchasers for the Lancashire looms in the cotton markets of the world.

Consumption of cotton on the Continent.

The following figures of the spindle-power of the Continent were given some years ago; but as in France, and in Russia, and several other countries, the manufactories have, I believe, of late years greatly increased, the figures cannot be considered very reliable:—

Spindle-power of the Continent.

	Spindles.
France	4,000,000
Holland	2,000,000
Germany	2,000,000

	Spindles.
Russia	2,000,000
Austria	1,500,000
Switzerland	1,500,000
Spain	1,000,000
Italy	500,000
Belgium	500,000

149. The following figures of the *consumption* of cotton by the different Continental powers during the year 1868, will give a more correct idea of their importance as manufacturing countries:—

Consumption during 1868 *of Bales of* 400 *lbs.*	
France	630,000
Germany	420,000
Russia	250,000*
Holland	140,000
Spain	140,000
Belgium	90,000
Trieste, for Switzerland and Germany, &c. Italy	100,000
Total Bales...	1,770,000

I have been unable to obtain any very reliable information as to whether this quantity is sufficient to keep all the mills on the Continent in full work, or whether, on account of the scarcity of cotton, the foreign manufacturers are obliged to work "short time." It may, however, be not unfairly assumed that the scarcity of the raw material affects the Continental market in some degree, and perhaps 2,000,000 of bales may be taken as representing the quantity of cotton required to keep all the mills at full work. The consumption of England has been shown to be below its requirements, and 3,000,000 bales have been given as the quantity required, making for the *requirements* of Europe a total of 4,780,000 bales of 400 lbs. each. If to the figures of the actual consumption on the Continent be added the total of the *consumption* of Great Britain, which has been shown in a previous paragraph to have been 2,490,000 bales, we have a total consumption for Europe of 4,260,000 bales of 400 lbs. In other words, of the total quantity of cotton consumed in Europe, Great Britain took a little less than 59 per cent., the Continent more than 41 per cent.

Annual consumption of Europe.

150. But as consuming considerable quantities of cotton, there are other countries, besides those in Europe above mentioned, which

* Excluding quantity received from Central Asia.

drain off large supplies from the markets of the world, and thereby affect the European manufacturer. Some of the countries which produce cotton largely also consume a considerable portion of their produce; and this is notably the case in the United States, where the spinning and weaving manufactories are on the increase, and whereby Europe is deprived of much cotton which would otherwise be available for her mills. I have taken the following totals from *Hunt's Merchants' Magazine*, which gives the Factories in the several States in detail:—

Consumption in America.

States.	No. of Mills.	No. of Spindles.	Average No. of Yarn	No. of bales of Cotton spun yearly in bales of 400 lbs.
Northern States	561	6,161,962	28·03	926,000
Southern States	82	218,099	12·93	76,000
Total....	643	6,380,061	27·51	1,002,000

These are only the mills for which statistics had been received. It is further estimated that there are yet other mills consuming 90,000 bales, and that about 30,000 bales of cotton are consumed otherwise than in mills, making a total consumption for the United States of 1,120,000 bales. The statement is, however, believed to be somewhat above the mark, but the demand for cotton in America may be fairly estimated at about 1,080,000* bales of 400 lbs. The accompanying extract describes the chief manufacturing districts in the States:—

Spindle-power of the United States.

> "The largest consumption is in Massachusetts, the amount spun in that State being one-third of the total for the United States. Next in extent comes Rhode Island, next New Hampshire, and then Pennsylvania, Connecticut, and Maine. The New England States, according to this return, consume about 295,000,000 lbs., or 73 per cent. of the total quantity used in the country. New York ranks seventh in this class of manufactures. Among the Southern States, Georgia takes the lead, followed in order by South Carolina, North Carolina, and Alabama. The largest mills are in Maine and New Hampshire, where the average of spindles is 20,000 to each mill, and in Massachusetts, where the average is 16,500 per mill. The finest average class of

The chief manufacturing districts.

* Figures given by Messrs. Neill Brothers.

yarns is made in New Jersey, where the average number is 36·22; and next in order Rhode Island, New York, Vermont, Connecticut, Massachusetts, New Hampshire, and Maine. In the South the goods produced are almost exclusively of a coarse, heavy character, the yarns varying from number 8·39 in Mississippi to 16·91 in Alabama. The West has scarcely any standing in this branch of manufacture, three States only being represented, and the consumption in these being but 7,000,000 lbs., or less than one-fourth that of the South."

Nearly the whole quantity of yarn and cloth thus manufactured is consumed in the country, the exports being nominal.

151. Then comes India. She has always been celebrated for her manufactures, which, although much affected by the cheap Manchester piece goods and yarn and the high price of cotton, still flourish in many parts of this country, notably in the Provinces from which I am now writing. It is difficult to frame even an approximate estimate of the local consumption, which, besides the cotton required for the spindles and the looms, includes a large quantity taken up for various domestic purposes, but such a statement, if reliable, would be valuable; and I am now collecting data which I trust will enable me to furnish the information in detail with my next report. My estimate, a very rough one, (the data, such as can at this moment be procured, being given in a later paragraph,) would make the quantity at present retained for home consumption in India to be about 600,000 bales.

Cotton consumed in India.

152. Lastly, we have China. As is well known China grows cotton and consumes it largely. But the home supply is not adequate to her wants. And for a long series of years she has drawn on India for her supplies. When the cotton famine raised the price of the staple in Europe so remarkably, not only did China cease to draw from India her wonted supplies, but she even exported part of her home crop. Matters have now changed, and China has again entered the Indian market as a competitor with the purchasers for the European manufacturers. Last year she took of our Indian crop 135,000 bales. I am unable to frame an accurate estimate of the quantity grown in China and consumed there. The figures I have in the reports before me are all framed "in the absence of reliable statistics," and it is not improbable that the out-turn is much over-estimated. The Province of Ningpo is represented as producing 62,500 bales. In Kuang-jao-ken-han the cultivation is stated to be 6,050,000 acres, with an out-turn per acre of 1,250 lbs. of cotton; and, even assum-

Consumption in China.

ing that the out-turn represents cotton in the seed, and that but one-fourth of the produce is cotton wool, the out-turn for this Province would be over 4½ millions of bales, or nearly as much as India and America both put together produce. I think this must be above the mark, and that it would be safer to leave China out of the calculation altogether, noting only that in 1868 she drained 135,000 bales of cotton from the Indian market.

153. In Central Asia too cotton is produced, consumed, and exported in some quantity. No reliable estimate of any one of those quantities can at present be framed, but a Russian friend of mine informed me recently that Central Asian cotton finds its way to the Russian mills.

154. Recapitulating then the figures given above, it would appear that in 1868 the consumption of cotton in the chief manufactories in the world was approximately as follows. It is not possible, with the limited information at my command, to give the small quantities retained for local consumption in the countries which produce but comparatively little, but the following figures will perhaps be sufficient to give a rough idea of the *requirements* and present consumption of the chief manufacturing countries:—

Cotton requirements of the world.

	In Bales of 400 lbs.	
	Actual consumption.	Approximate quantity required.
Great Britain	2,490,000	3,000,000
The Continent of Europe	1,770,000	1,800,000
America	1,080,000	1,080,000
India	630,000	630,000
China took of Indian cotton	135,000	130,000
Total	6,105,000	6,640,000

Thus 6,105,000 bales of cotton were actually consumed, whilst about six and three quarter millions of bales were required to keep the mills in full work. Doubtless there were considerable stocks on hand, from which the required quantity could have been furnished if the prices had been suitable; but by supply, I mean a supply sufficiently reasonable in

price to allow of the manufacturer purchasing. It will be seen, then, that, excluding China's home supplies from the calculation, Great Britain takes but 40·82 per cent. of the raw cotton available in the markets of the world. The large balance, 59·18 per cent. of the crop, taken by other countries must affect our home manufactures. For the great demand for cotton for the Continental and American market must oblige the English purchaser to pay more for his article; whereas the large quantity of cotton goods manufactured in foreign countries must in the long run tell on the demand for our piece goods and yarn.

The cotton supply of the world.

155. I would now desire to attempt to show the countries which produce the cotton to supply this immense demand, and the part which each of the great cotton-growing countries plays in the market.

India's former position in the market.

156. Although but few of us have time to go back within even a considerable distance of the Deluge, still it may not be out of place, before considering the supplies of the past year, to sketch into the foreground a few of the figures showing the position which India once held, then lost, and is now regaining, in the cotton supply of the world, and for which and other information I have drawn on some of the well-known published statistics of the Lancashire trade. The figures, it is true, refer only to Great Britain, and do not include the export to other countries; but as Great Britain takes the greatest share of the cotton, the fluctuation in the supplies to our manufactures will also indicate pretty generally the fluctuations in the supplies to the other consuming countries.

Indian cloth and yarn once imported by Great Britain.

157. The first point worthy of note is that, in former days, not only did India provide a large share of the raw cotton consumed in England, but the Hindoos, always skilful spinners and weavers, supplied our country with much of the cotton yarn and cotton cloth then in use. England, in those days, not only had not thought of manufacturing yarn and cotton cloths for export to all parts of the world, but she was dependent on India for the supply of the fabrics, the production of which has now been almost completely undermined by the power-loom goods, now so largely imported by India. At the commencement of the 18th century, England imported from all parts of the globe the modest quantity of about 800,000 lbs. of raw cotton, or, reduced to bales of 400 lbs. weight, in which I propose to give all these statistics, 2,000 bales of cotton, or about a $\frac{1}{140}$th part of what these Provinces now send to Bombay, and $\frac{1}{80}$th part of the total exports from India, and

just $\frac{1}{1245}$th of what was consumed in our home manufactories during the past year. This small quantity was, as Mr. Ashworth tells us, used chiefly for *candle-wicks!* India supplying the small quantity of yarn and cloth which our perhaps then less-well clothed population required, amounting to a quantity which, according to the figures given in Mr. Mann's most valuable book, did not in its best year—the year 1807—exceed 220,000 lbs. in weight.

158. This state of things was, however, to last but a very short time. In 1764 commenced the series of what has been called those "stupendous inventions," which have caused the extraordinary consumption in Great Britain of raw cotton, the increase of which it will here be sufficient to show in periods of about 20 years apart:—

Increase in the imports to Great Britain.

Quantity of Cotton consumed in Great Britain during the following years in Bales of 400 *lbs.*

	Bales.
1700	2,000
1764, just before Arkwright's patent had expired	9,500
1785, after the expiration of Arkwright's patent	45,000
1800	130,000
1820	362,000
1840	1,160,000
1860, before the cotton famine	2,697,500
1868	2,490,000

"Such," as Mr. Mc Culloch says, "has been the influence of these inventions in machinery, that we have overcome all difficulties, and neither the extreme cheapness of labour in Hindustan, nor the excellence to which the Natives had attained, has enabled them to withstand those who buy their cotton, and who, after carrying it 5,000 miles to be manufactured, carry back the goods to them."

159. When the demand in Great Britain began to increase, India soon lost her place, and America took a position in the supply of the raw material as remarkable as that in which Great Britain had established herself as a consumer,—the exports from that country increasing seven hundredfold in the period between 1793 (the date of Eli Whiting's invention for separating the cotton wool from the seed), and 1859, just before the commencement of the American war, the quantity from the two years in question being 4,000 bales and 2,800,000 bales respectively, and this

Increase in the American exports.

quantity not including a considerable proportion of the crop retained for manufacture and consumption in the States.

160. From the commencement of this century until the breaking out of the war in the Southern States, not only Great Britain, but all Europe depended chiefly on America for the raw material, the supply of which, in a considerable quantity and at a reasonable rate, had now, consequent on the large capital invested in machinery, and the vast trade which had sprung up, become a necessity of the public welfare. The following figures reduced from Mr. Mann's book, already referred to, will show the several sources from which the large supplies given at a former page were drawn; that is to say, they show the imports of cotton into Great Britain, which figures exceed the consumption by the quantity retained for stock and re-exported to foreign markets:—

Europe originally dependent on American supplies.

Quantity of Raw Cotton imported into Great Britain in Bales of 400 *lbs.*

	United States.	Brazil.	Mediterranean.	East Indies.	West Indies.	Other places.	Total.
1820...	260,000	61,000	6,000	34,000	19,000	4,500	384,500
1840...	1,176,000	43,000	22,000	211,000	3,000	10,600	1,465,600
1860...	1,956,000	59,000	84,000	451,000	1,600	22,000	2,573,600

Or, to borrow again Mr. Mann's valuable figures, the relative proportion of the supplies to Great Britain of the different cotton-producing countries during the years preceding the American war may be shown thus:—

Years.	United States.	Brazil.	Mediterranean.	British East Indies.	B. W. I. B.Guiana	Other parts.	Grand Total.
1815 to 1819	·46	·15	.....	·26	·08	·05	1·00
1820 to 1824	·68	·15	·02	·09	·05	·01	1·00
1825 to 1829	·70	·11	·05	·10	·03	·01	1·00
1830 to 1834	·79	·09	·02	·09	·01	...	1·00
1835 to 1839	·79	·06	·02	·12	.....	·01	1·00
1840 to 1844	·81	·03	·01	·14	.....	·01	1·00
1845 to 1849	·84	·03	·02	·11	.....	...	1·00
1850 to 1854	·78	·03	·03	·16	.....	...	1·00
1855 to 1859	·76	·02	·03	·18	.....	·01	1·00

VII.

Map Showing
the Cotton-Shed of the World.

VII.

Map Showing the Cotton-Shed of the World.

161. America then had it all her own way. It will be seen that at one time—in the year 1849—84 per cent. of the cotton imported into England came from that source. The supply from India during the century fluctuated from 10 to 18 per cent. of the quantity taken by Great Britain. It is true that these figures do not show the total exports from India, but represent merely the quantity which the spinners would condescend to take of our inferior crop; for I find that during the years 1840 and 1860, the periods given above, India, besides sending a small number of bales to England, exported during these years respectively 135,000 and 140,000 bales to China and other countries.

India's reduced exports.

162. Then came the American war, the cotton famine with its fearful consequences, and the great demand for raw cotton, and the struggle made by all countries to supply an article which paid so well. Cotton farming was undertaken in nearly every country where the plant would grow, and numerous sources of supply were tapped, some of which, now that America again pours its 1½ to 2 millions of bales into the market, have, it is to be feared, dried up. It will be sufficient to indicate here briefly the countries that are now the chief cotton reserves of Europe. Of the great producing countries, India, Brazil, Egypt, the West Indies, helped to make up the great deficiency in the American supplies, and even China began sending cotton to the European market. Our colonies, —Australia, New Zealand, the Cape, the West Coast of Africa, the numerous Islands under our flag,—sent their contributions, and the cultivation in the countries bordering the Mediterranean was greatly developed. It would be tedious to mention all the places which send their quota and are included under the heading of "Other Countries;" but in the accompanying map, which is intended to show roughly the "cotton-shed of the world," will be seen, marked in green, the chief cotton-growing countries, and the extent of the exports is given approximately at the foot.

Increased supply from other countries consequent on the American war.

163. Bearing in mind the figures given in the preceding paragraph of the sources of supply in 1860, the effect of the American war in stimulating the supply of cotton from India and other countries, as given in the following table, will appear very distinctly:—

Cotton imported into Great Britain reduced to Bales of 400 *lbs.*

	From America.	East Indies.	Brazils.	Egypt.	Turkey, West Indies, and other sources.	Total.
1860...	2,838,000	422,000	46,000	129,000	7,000	3,442,000
1861...	2,026,000	740,000	45,000	115,000	7,000	2,933,000
1862...	80,000	805,000	60,000	175,000	13,000	1,133,000
1863...	145,000	1,043,000	62,000	242,000	45,000	1,537,000
1864...	217,000	1,349,000	109,000	321,000	84,000	2,080,000
1865...	488,000	1,056,000	136,000	410,000	151,000	2,241,000
1866...	1,282,000	1,619,000	178,000	205,000	94,000	3,378,000
1867...	1,361,000	1,350,000	177,000	223,000	96,000	3,207,000
1868...	1,350,000	1,370,000	250,000	236,000	80,000	3,286,000
Total...	9,787,000	9,754,000	1,063,000	2,056,000	577,000	23,237,000

Proportion of the Total Supply furnished by each Country during the period 1860—68.

	From America.	East Indies.	Brazils.	Egypt.	Turkey, West Indies, and other sources.	Total.
1860...	82·40	12·25	1·33	3·83	0·19	100
1861...	69·10	25·23	1·52	3·90	0·25	100
1862...	7·03	71·00	5·35	15·45	1·17	100
1863...	9·40	67·86	4·02	15·82	2·90	100
1864...	10·40	64·86	5·24	15·45	4·05	100
1865...	21·85	47·00	6·07	18·33	6·75	100
1866...	37·93	47·92	5·27	6·03	2·80	100
1867...	42·44	42·09	5·53	6·95	2·99	100
1868...	41·08	41·69	7·61	7·19	2·43	100
Total ..	42·12	41·98	4·58	8·83	2·49	100

164. It will be seen then that America, from supplying at one time so much as 82·40 of the quantity of cotton imported into Great Britain, fell as low as to send us but 7·03, whilst India rose from contributing but 12·25 per cent. to the position of supplying 71 per cent. This was in 1862, and although she has since lost some ground, she still stands high on the list as supplying nearly 42 per cent. of the amount

Increase in the Indian exports.

annually imported. Brazil and Egypt too have come forward remarkably, and not only by reason of the quantity of cotton produced, but also, on account of the excellence of the quality, their supply is of importance. The supplies from the various other sources too, although small in themselves, amount in the aggregate to a not inconsiderable sum.

165. America still stands well at the head of the list when both the quantity and quality of her cotton is considered. From all accounts there can be no doubt that the cultivation has considerably suffered by the war, and it is considered doubtful whether the total crop, from which it must be remembered the large quantity retained for local consumption has to be deducted, will for some time to come exceed 3,000,000 bales, leaving about 2,000,000 bales available for exportation. How the crop has fallen off, the following figures taken from McCulloch's Commercial Dictionary will show:—

State of the cultivation in America.

United States Cotton Crop.

1859-60	4,669,770
1860-61	3,656,086
1861-62	4,800,000
1862-63	1,500,000
1863-64	500,000
1864-65	300,000
1865-66	2,154,476
1866-67	1,951,988

The figures for the crop of 1867-68 are given by Messrs. Neill Brothers at 2,581,000 of bales, which, allowing for the largeness of the American bales, give about 2¾ millions of bales of 400 lbs. The cultivation is apparently recovering itself in the South, and if the effect of the Fertilizers referred to in an earlier paragraph of this Report comes up to the present expectations, the out-turn should be increased largely. For the present, however, it may not be incorrect to put down the American crop at about 2¾ millions of bales.

166. The supply of Brazilian cotton has undergone a great change. The crop is packed in small bales, which weigh hardly more than 150 lbs., but reduced to the standard of bales of 400 lbs., the exports amounted last year to 272,000 bales.

Supplies from Brazil.

167. The Egyptian bale is the largest, weighing about 500 lbs. of cotton nett. I gather from recent circulars that the crop, which is liable to fluctuations,

Egyptian cotton.

amounted last year to about 300,000 bales, of which nearly the whole was exported. The staple of this cotton is excellent.

Other sources of supply.

168. The other sources from which cotton is drawn, besides including the British Colonies noticed in a former paragraph, consist of many cotton-growing tracts in Turkey and in the Levant, the supply of which, judging from the Consular reports, cannot be regarded as very constant. Most of these places will be found marked on the map. The cotton is chiefly taken by Trieste, Marseilles, and the Mediterranean ports; and the accompanying extract from an old Marseilles Cotton Circular, which gives the names of the various cotton-growing countries, will show that these localities are numerous:—

Marseilles Imports and Stock, May 1867.

	Imports, Bales.	Stock, Bales.
Jumel	3,623	1,865
Salonique Indigène Salonique Graine Amérique Volo	877	1,007
Dardanelles	...	64
Pyrée	...	61
Smyrne Kircagach Souboujeac	150	1,229
Tarsous Adenos	12	624
Idelep Lattaquie	...	52
Naplouse, Acre	24	65
Chypre	5	174
Perse, Caucase	43	1,828
Constantinople	...	709
Malte	15	5
Algérie	1	267
Castellamare Bianevilla	175	150 184
Brésil	82	39
Surate Dhollerah	...	527
Coconadah	...	1,100
Bengale	...	352
Guayra	...	640
Iviza (Espagne)	..	..
Total.....	5,007	10,942

169. Lastly, we come to India. In a former paragraph I have noticed that, although it is possible to supply sufficiently reliable data of the production, consumption, and export of cotton for these Provinces, I am not in possession of detailed statistics for the Presidencies and Governments to which my duties do not extend. I think, however, that the figures in the annexed Statement will give a sufficiently correct notion of the production of cotton in India. The out-turn per acre has been taken at 80 lbs. of clean cotton in the best cotton-growing tracts, at 50 lbs. of clean where the plant is not so successful, and at these rates the annual out-turn would be about 2,300,000 bales of 400 lbs. each. Now we know pretty accurately from the various returns the annual exports from this country during the past year, 1868. These exports amounted, as shown below, to 1,676,000 bales of 400 lbs. each:—

Indian supplies.

	Bales.
Bombay	1,179,000
Carwar	25,000
Kurrachee	26,000
Coconada	32,000
Madras	124,000
Tutocorin	84,000
Calcutta	200,000
Rangoon	6,000
Total	1,676,000

The actual number of *packages* shipped from the various ports exceeds the number shown above, as many of these bales contain much less than 400 lbs. of cotton, the standard to which all the calculations in this sketch have been reduced. Deducting from the estimated out-turn of 2,297,500 bales the 1,676,000 bales exported, leave a balance of 621,500 bales for consumption in the country. For stocks, which run on from year to year at about the same figure, I have not made any allowance, but they cannot be very heavy, and need hardly be included in such a rough estimate as the present.

170. I am aware that the estimate both of the area under cultivation and the quantity retained for home consumption may to many appear small. I find in Mr. Mann's book, that, according to various authorities, the cotton acreage of India is estimated at 24,000,000 of acres, whilst the out-turn is put down at from 6 millions to 2½ millions of bales of 400 lbs., all of which estimates Mr. Mann, correctly I think, pro-

nounces to be too high. I cannot believe that the cultivation comes any where near the first estimate. The statistics of cultivation in the chief cotton-growing districts in the Bombay Presidency, the Central Provinces, the Berars, in the North-West Provinces, Oude, the Punjab, Burmah, and the Madras Presidency, are taken from the Government returns, and may be accepted as not very wide of the mark. The area taken for Bengal is partly from some returns, and partly from an estimate, but the cultivation there is not believed to be very extensive. This only leaves the Native States, for which, if anything, the estimate is somewhat high. But even then the totals fall short of 13 millions of acres, and there is no reason to believe that the cultivation is lower now than it formerly was.

Exaggerated estimates of Indian cotton.

171. The quantity retained for home consumption may appear small, being, if the population of India is taken at about 200 millions, about 1 lb. 4 ozs. per head, or taking into account the cloth and yarn imported, the total weight of cotton to each inhabitant would be about 2 lbs. 5 ozs. per head. This may appear little, but the pair of *dhotees*, or loin cloths, which form the chief part of the man's dress, weigh on an average rather less than two pounds, or, say, one lb. each, and the generality of the people cannot afford to purchase more than one pair a year: the poorer classes wear one set for several years, according to their means. The woman's dress is much lighter; and as for the children, who form no small body in the above estimate of the population, a very large proportion of them hardly know clothes at all! Under all these circumstances, I doubt the above estimate being found very wide of the mark.

Quantity retained for local consumption.

172. The consumption of cotton is, or rather was, very great throughout the country. In the first place, the manufacturers of cloth and yarn took no small quantity. But the importation of cheap machine-made piece goods has in many parts driven the native spinners and weavers altogether out of the market, and many have had to take to working on the roads, or have been engaged as farm-labourers. In this part of India—the old Nagpore Province—the trade is still particularly and exceptionally strong. But it consists chiefly of fine goods,—fine dhotees with silk borders,—which the peasantry in the neighbouring districts and in the Berars, enriched by good cotton harvests, can now afford to buy. Our fabrics find great favour in the Deccan, and are supplied in large quantities to the better class of the Southern

Native cloth manufactures.

Maratha Country. The cultivators, too, for every-day wear, affect a stout cloth, made in great perfection and in large quantities by the Dhêrs and other outcastes living on the borders of the jungle tracts. And this stout serviceable country-made cloth,—which will stand the smashing of the native washerman, will keep out the sun, the rain, and the cold,—our machine-made piece goods have not yet been able to drive out of the field. But these Provinces, as regards the manufacture of Native cloth, are, I believe, an exception; and although spinning and weaving is carried on, more or less, all throughout India, the European piece goods are fast driving the trade out of the market. Wherever the railway line passes this is invariably the case; and I was struck by the account recently given me by a native gentleman who had returned from a visit to his home in Marwar, where he found that in a few years European piece goods had become thoroughly established. The domestic uses to which cotton is put are various—from the small wick for the oil-lamp, to the mass of cotton which is required to make the stuffing of a big native pillow comfortable. Then cotton is used for making rugs, and carpets, and horse gear, and for lining the coats worn in the North. Our jails (although many now use much English yarn) take considerable supplies for prison labour, and the tent manufactures must drain off no small amount annually. But certainly all the first-mentioned uses to which cotton is put have decreased since cotton became so expensive a commodity; and the poor native, who has been obliged to forego his annual suit of clothes, has also had to think twice of purchasing a new pillow, or re-stuffing his *resai*, or counterpane, with cotton. Other fabrics too have been substituted for cotton; and, as my gardener told me to-day, he had to wear his turban into rags, and when it was utterly worn out the shreds went to help to stuff a pillow for one of his children, who, now that cotton was so dear, had been long denied the luxury!

English piece goods driving the native cloth manufactures out of the market.

173. Lastly, in the Presidency towns, and in some up-country stations, several large spinning and weaving mills are now to be found, which use up no small quantity of raw cotton: and thus a considerable supply of cotton is cut off before reaching the ports, and deducted from the quantity which would otherwise be available for the home market. A list of the factories, the spindle-power, &c., and an estimate of the consumption, is given in the following Statement **J**, and it is not impossible that these manufactures of cloth and yarn, which are suc-

Spinning and weaving factories in India.

J.

List of Spinning and Weaving Mills in the Bombay and Bengal Presidencies.

Town.	Names of Mill-owners or Company.	No. of Spindles.	No. of Looms.	Annual consumption of Cotton Bales of 400 lbs.
Bombay	Albert Mills' Company	18,000	...	3,400
	Bombay United Spinning and Weaving Company ...	21,000	335	4,800
	Bombay Spinning and Weaving Company	29,000	...	6,600
	Great Eastern Spinning & Weaving Co., Limited.....	30,000	608	6,000
	Oriental Spinning and Weaving Company	40,000	800	7,000
	Alliance Spinning Company.	22,000	...	5,000
	Victoria Spinning Co., Ld....	9,000	...	1,800
	Bombay Royal Spinning and Weaving Co., Limited.....	33,000	680	7,600
	Manickjee Petil's Spinning and Weaving Company ...	60,000	840	10,000
Coorla.....	Bomanjee Hormusjee Spinning and Weaving Co., Ld.	27,000	469	6,200
Ahmedabad ..	Ahmedabad Cotton Spinning and Weaving Company ...	5,000	...	1,000
Duskeohie ...	Behadar Spinning and Weaving Company	15,000	...	3,000
Broach	Broach Cotton Mills' Co. ...	17,000	...	3,400
Surat	Jaffer Ali Spinning and Weaving Company, Limited ...	12,000	...	2,000
	Total Bombay	338,000	3,732	67,800
Calcutta	Goosery Cotton Mills	15,000	70	3,800
	Fort Gloster Cotton Mills...	27,500	...	2,800
Cawnpore ...	Elgin Cotton Mills	10,000	150	3,000
	Total.....	390,500	3,952	77,400

HARRY RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

VIII.

Comparative Map.

INDIA and AMERICA.

VIII.

Comparative Map.

INDIA and AMERICA.

cessfully carried on here, may in course of time affect not imperceptibly the demand in India for piece goods manufactured in Europe.

174. Facing this page will be found a rough sketch showing India and the United States. The chief cotton-growing districts of each country are given, and the estimated produce is shown. Of course, as compared with the United States, the small out-turn of India to the large acreage is noticeable. But it will be remembered that, besides many other advantages, the lands of the States are, comparatively speaking, composed of "virgin soil" and new to cotton, whilst for thousands of years the Indian districts have been worked with this crop. Indeed, I find that, in some of the older districts of the United States, the out-turn per acre is given as low as 112 lbs., as in the case of Florida, and this is not more than could be picked from a good field in the valley of the Poornah in the Berars; whilst in the new country,—Texas, for example,—the yield is put as high as from 337 to 400 lbs. of clean cotton.

Small out-turn of cotton per acre in India as compared with America.

175. The cotton supply of the world, excluding China, the Central Asian supplies, and small quantities used in producing countries, may then be thus recapitulated:—

Total cotton supply of the world.

Quantity produced by the various Countries in Bales of 400 *lbs.*

America	2,900,000
India	2,300,000
Egypt	310,000
Brazil	272,000
Other Countries	317,000
	6,099,000

176. Having thus glanced at the demand for cotton in the several manufacturing countries, and the extent to which that demand is met by each of the cotton-producing tracts, it remains to be explained how the supply is distributed, who takes the greater share of the American crop, where the Indian cotton is in favour, and the countries which chiefly depend on Egypt and Brazil for the staple.

Distribution of the cotton crops of the several producing countries.

177. Taking America first, we find that, as may be supposed, England is her best customer. Of the crop of 1867-68, the quantities were thus divided:—

Distribution of the American crop.

Crop of 1867-68 *in Bales of* 400 *lbs.*

Exported	to Great Britain		1,350,000
Do.	to Continent direct		470,000
Consumed...	Northern States	900,000	1,080,000
	Southern States	180,000	
	Total Bales*...		2,900,000

178. Thus 46·50 per cent. was imported into England. But this was not all for home consumption. England was, for long, the market in which nearly all the cotton transactions of the world were held; and the bales required for the continent came first to Liverpool, and were there purchased for the continental spinners, and reshipped to foreign ports. Now, however, although a considerable quantity still passes through Liverpool,—197,000 bales of American cotton having been shipped to the Continent through our markets during the past year,—the Continent takes more than double that quantity direct.

Cotton taken by the Continent through England.

Of the Brazilian cotton crop.

179. The Brazilian crop was thus distributed:—

	Bales of 400 lbs.
Exported to Great Britain	250,000
,, to Continent	22,000
Total Bales.....	272,000

And again, of the 250,000 bales taken by England, 38,000 were afterwards sent to the Continent.

Of the Egyptian crop.

180. Egypt exported her 310,000 bales to the countries given below:—

	Bales of 400 lbs.
Exported to Great Britain	236,000
,, to Continent	74,000
Total Bales.....	310,000

And of the 236,000 bales sent to England, 12,500 were supplied to the Continental markets, Great Britain retaining 223,500 for home consumption.

---

* I have not thought it necessary to complicate this sketch, which is only intended to convey a *general* idea to those in India who take an interest in the subject, with the details and deductions on account of Stocks, which would have to be included in a Statement pretending to anything like perfect accuracy. The American figures are taken from Messrs. Neill Brothers' Report.

181. "Other Countries"—the West Indies, Turkey, the many Mediterranean ports indicated by the Marseilles circular—sent 317,000 bales, of which the greater quantity went to the Continent direct.

Of the cotton supplied by other countries.

182. Lastly, we come to India. The quantity shipped from each port during 1868, and the destination of the consignments, are given in the accompanying Statement, the totals having been all reduced to 400 lbs. nett. The amount falls rather short of the figures of the official Statement published by the Financial Department, but agrees with most of the circulars and Chamber of Commerce's returns which I have been able to procure, and I am inclined to believe that the official Statements do not make full allowance for "tare," which has been deducted from my estimate. But I hardly expect to be able to collect this class of information in the form in which I would wish to present it, until I have an opportunity of visiting the several ports, and consulting the Chamber of Commerce as to the most convenient and useful mode of publishing these statistics:—

Distribution of the Indian cotton crop.

	INDIA, 1868.			
	Approximate Statement of the export of Cotton reduced to Bales of 400 lbs.			
	To Great Britain.	To the Continent direct.*	To China.	Total.
Bombay ... Bombay	991,000	135,000	53,000	1,179,000
Bombay ... Carwar	25,000	.....	.....	25,000
Bombay ... Kurrachee ...	26,000	.....	.....	26,000
	1,042,000	135,000	53,000	1,230,000
Madras ... Coconada ...	32,000	.....	.....	32,000
Madras ... Madras	94,000	30,000	.....	124,000
Madras ... Tutocorin ...	84,000	.....	.....	84,000
	210,000	30,000	.....	240,000
Bengal—Calcutta	116,000	2,000	82,000	200,000
British Burmah—Rangoon.	3,000	3,000	.....	6,000
Total.....	1,371,000	170,000	135,000	1,676,000

* In this column I have included all cotton sent to "Falmouth for orders," which, I believe, goes as a rule to the Continent without being landed in Great Britain.

1,371,000 bales were thus shipped to Great Britain, or 81·80 per cent. of India's total *Exports*. Of the quantity which reached England, 550,000 bales were thence again exported to the Continent after their arrival at our markets. In other words, Great Britain retained but 48·98 per cent. of the cotton exported by India, and but 35·70 per cent. of the quantity grown in this country, and, as compared with the Continent, worked up but 35·70 per cent. of our cotton against 31·30 per cent. used in continental manufactories.

183. The quantity reshipped from England to the Continent is given in detail in the following Statement **K**.

184. For facility of reference, the quantity of each sort of cotton taken by Great Britain and the Continent is tabulated below, and the maps will, I trust, help to explain this interesting but, perhaps, rather complicated question:—

Total redistribution of each sort of cotton.

1868.—*Bales of* 400 *lbs.*

	Crop.	Home consumption.	Exports to				
			Great Britain, less taken for export.	Continent through Great Britain.	Continent direct.	Total to Continent.	To China.
America	2,900,000	1,080,000	1,153,000	197,000	470,000	667,000	..
India	2,300,000	624,000	821,000	550,000	170,000	720,000	135,000
Egypt	310,000	....	223,500	12,500	74,000	86,500	..
Brazil	272,000	....	212,000	38,000	22,000	60,000	..
Other Countries...	317,000	....	80,500	7,500	229,000	236,500	..
Total....	6,099,000	1,704,000	2,490,000	805,000	965,000	1,770,000	135,000

185. Having thus attempted to sketch the demand for cotton, the supply, and the distribution of that supply, among the various manufacturing countries, I would now desire to offer a few remarks regarding the position held by India in this great trade.

186. The above figures will show that, excluding the China crop from the calculation, India produces about 37·71 per cent. of the cotton

K.

Statement showing approximately the quantity of Cotton imported into the United Kingdom, the Exports therefrom to the Continent, and the Quantity retained for consumption during the year 1868.

	Description of Cotton.					
	American.	Indian.	Egyptian	Brazilian.	Other sorts.	Total.
Imported into Great Britain	1,350,000	1,371,000	236,000	250,000	88,000	3,295,000
Exported to—						
Russia	38,453	28,630	600	19,847	835	88,365
Denmark	....	1,400	...	..	5	1,405
Prussia	14·000	23,257	428	4,054	122	41,861
Hanover	88	379	...	..	..	467
Belgium.....	45,000	76,700	1,900	1,063	1,145	125,808
North German Ports...	32,679	151,000	2,533	8,380	2,244	196,836
Holland	31,000	136,090	1,800	1,820	921	171,541
France	21,000	90,000	4,400	2,328	1,810	119,538
Portugal.....	158	390	...	39	62	649
Spain.....	2,000	5,700	...	30	..	7,730
Italy, Genoa	4,509	11,000	29	214	..	15,752
,, Venetia	148	490	..	..	..	638
,, Tuscany	.....	22	..	..	..	22
,, Naples	304	524	..	38	..	866
United States.....	23	19	764	..	..	806
Sweden	5,430	17,600	18	170	270	23,488
Norway.....	1,936	6,350	16	..	48	8,350
Egypt	211	4	..	..	..	215
Other Countries.....	61	535	12	17	38	663
	197,000	550,000	12,500	38,000	7,500	805,000
Balance retained for consumption (Stocks excluded)	1,153,000	821,000	223,500	212,000	80,500	2,490,000

HARRY RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

used in the world, and that she provides 36·17 per cent. of the cotton used in the manufactories of Europe. During the last few years—from 1860 to 1868—it has supplied England with nearly as much cotton as America has, and has risen from the position of supplying but 18 per cent. of the cotton worked up in Great Britain to that of giving 33 per cent. of the amount consumed in our country. Doubtless, in consequence of the shortness of the staple, and the comparative inferiority of our produce, the cotton of other countries is preferred in Great Britain and in the Continental mills; and, in many cases, our produce is taken quite as a *pis-aller*, and would not be looked at if the supply of a superior cotton was more abundant. It may then, perhaps, be thought that the position of Indian cotton is a critical one, and that, as has sometimes been suggested, it is hardly fair, under the circumstances, to stimulate the production, and to try and induce the cultivator to grow cotton, when he may be liable, any day, in consequence of an increased crop in America, to be left in the lurch. But, even admitting the probability of increased supplies from America, it would appear doubtful whether, unless these supplies develop enormously, the price of Indian cotton would fall so low as not to offer the cultivator sufficient inducement to grow this crop, which, putting the question of it commanding a high price aside, will always be popular on account of the small amount of trouble that its cultivation entails. For it is deserving of notice, that India is establishing for herself a strong position in the European market. Her cotton—thanks to improved means of communication, and the facilities thereby rendered for direct dealings between purchaser and producer—now reaches Europe in a far purer and more serviceable state than formerly, and the best judges pronounce "that it will now serve pretty well for at least three-fourths of the work the American cotton does." Added to this, there is the circumstance that efforts are now being made to improve this no-longer-despised produce; and that, by improved means of communication by railways and roads, the charges with which Indian cotton grown far in the interior was formerly heavily weighted are now being gradually reduced. And this latter point is very important; for, as will be readily understood, the effect of reducing these charges is to raise the limit of the price which can be spared to the cultivator for his produce, and thus to enable our cotton to compete at a less disadvantage with the produce of America and other countries. There yet remains a circumstance which would help to confirm the belief that Indian cotton will, for a long time yet, command a good price; and that the cultivator, who has already reaped such great benefit

Position now held by India in the cotton market.

from the trade, is not likely to be suddenly disappointed by the demand for his produce falling off. And it is this,—that although our short staple might not be able to face long in the English market the dangerous competition of an increased import of American cotton (and the manufacturers could not be blamed for throwing us over, if a better and cheaper article from America was available),—there is nevertheless reason to believe that our cotton has now gained for itself a position in the Continental market from which it will not be easy to oust it. In support of this view, I would refer to the figures given in the foregoing paragraphs, from which it will be seen that in 1868 the bales—1,541,000 —of cotton sent from India to Europe were distributed between Great Britain and the Continent in the following proportions:—

Position of our cotton in the Continental market.

	Bales of 400 lbs.
Total sent from India to Europe	1,541,000
Taken by the Continent direct	170,000
Taken by the Continent through Great Britain	550,000
Total Indian cotton taken by the Continent.	720,000
By Great Britain	821,000
Total Indian Exports .....Bales...	1,541,000

Thus the Continent took 46·73 per cent. of the Indian cotton sent to Europe, Great Britain retaining 53·27 per cent.

187. I have been very much struck with the direct trade in cotton between India and the Continent. Last year a French house in Bombay headed the list of shippers from that port. This year the number of foreign mercantile houses has largely increased. A French house has purchased land, and set up full-presses in the Berars, and there appears to be a determination in France to deal direct with India for her cotton. That the foreign trade is considered important by even the English merchants in Bombay, I have reason to know, from the circumstance of some of them shipping largely to the Continent: and it has even been found necessary in some cases to engage foreign assistants to carry on the correspondence thus entailed. There is now a branch of the French Bank at Bombay, which much facilitates all banking transactions with France and other countries in Europe.

Direct trade in cotton between India and the continent of Europe.

The French are soon to have a line of steamers to carry the full-pressed bales direct to the ports of the Mediterranean through the Suez Canal, and it is, I believe, now proposed to establish a branch of one of the Austrian Banks at Bombay, and to run a fortnightly service of the Austrian Lloyds Steamers from Trieste through the Suez Canal to Bombay.

188. I have no information at my command to show how the Continental manufactures have increased during the last few years, or the prospect of their further development; but the figures already given, and the blocks painted blue on the map, will show that they consume a large quantity of cotton. With improved facilities of communication, with, for instance, the Suez Canal open, and reasonable freights, it is perhaps not improbable that the cotton trade between India and the South of Europe may be still further developed; and it may not be incorrect to assume that, although the English market will command the pick of our crop, that even if Liverpool should not care to take the cotton grown by our ryots, they may still find good customers for their produce among the manufacturers of the Continent. For, so far as I can ascertain, our cotton is well suited to many of these foreign mills. Many of the French factories, and those in Germany, were, I understand, built after the scarcity of the long-stapled American cotton had begun to be felt. The machinery was therefore made to suit a short-stapled cotton; and thus our produce, which also has the merit of cheapness, finds favour abroad. In Russia, on the other hand, the style of the machinery, it is said, necessitates the use of a superior cotton; and thus whilst the French shippers buy up Oomraotee and other cottons readily, the purchasers for Russia generally prefer the cream of the Hingunghat crop, and the clean long-stapled Dharwar cotton grown from American seed. At Mülhausen, and at other factories in Alsace; at Elberfeld, and Gladbach, and Barmen, in North Germany; at pleasant Zurich* and at Glarus, where much of the Turkey Red so well known in Berar is made; at all the many factories which have of late years sprung up around Vienna; and even in Italy and Spain,—our Indian cotton is well known, and not lightly esteemed. Moreover too, the Continental

The Continental manufactures.

* Zurich and Elberfeld, I understand, possess great natural advantages for dyeing goods. The water is excellent and clear, and free from lime. Hence the choice of these situations for this great industry. This is just the case in the manufactures in these Provinces. The beautiful dhotees, with their crimson borders, so well known in the Deccan, are chiefly made at Oomrair, the water at which place is excellent.

IX.

Map Showing the Export of British Cotton Manufactures.

IX.

Map Showing the Export of British Cotton Manufactures.

spinners are now dealing with India direct; and when the Suez Canal is opened, and the expense of freight is reduced, their orders may be expected to pour in still more copiously. In support of this view, I would here ask attention to the following Statement **L**, which shows the figures of the export of the Indian cotton overland during the last few years, and would beg it to be borne in mind that these shipments have been made with the overland freight standing at an almost prohibitive rate.

Export of cotton from Bombay overland.

189. I shall be surprised if those who have had the patience to wade thus far through the clumsy details of this report are not impressed with the increase in the overland trade; with the prospects that these figures hold out of the trade, not only in cotton, but in all other valuable commodities between India and the Continent, being still further vastly developed, and with the grand future that is thereby promised to Bombay.

The grand future of Bombay.

190. One more small fact, and enough will, I hope, have been said to re-assure those who fear that the encouragement of the trade may hereafter re-act unfairly on the ryot. This year, 1869, of the Dharwar saw-ginned cotton, which was shipped from the new port of Carwar, 1,800 bales were sent direct to Kronstadt in a brig for the use of the Russian manufactures, and it is not improbable that next year may see some Russian merchant ships in the Bombay harbour. His Excellency M. Vlangaly, the Russian Ambassador in China, who recently passed through India on his return to St. Petersburg, evinced a keen interest in all matters connected with Indian cotton, which, in the present state of manufacture in Russia, was, he considered, of great interest to that country.

Direct trade with Russia.

191. In the last of the series of maps which accompanies this report the exports of manufactured goods from Great Britain to the various cotton cloth and yarn-consuming countries is shown.

Piece goods trade.

192. As already noticed, thanks to a combination of fortunate circumstances, some improvement in the cotton of these Provinces is now generally recognised. And although much yet remains to be done, and there is no excuse for working a whit the less zealously, still what little advance has been made is perhaps not insufficient to give us some reason for hoping for further improvement in the future. But, as I close the account of this another year's operations of my Depart-

Favourable circumstances under which my work has been performed.

L.

Statement showing the Number of Bales of Cotton shipped from Bombay Overland from 1st January 1865 to 30th June 1869.

Years.	Alexandria.	Trieste.	Venice.	Naples.	Genoa.	Marseilles.	Barcelona.	Havre.	Total to Continent.	Falmouth.	Southampton.	London.	Liverpool.	Total to Great Britain.	Grand Total to Continent and Great Britain.
1865	1,198	..	..	..	..	..	..	..	1,198	..	..	..	43,536	43,536	44,734
1866	456	..	..	..	..	..	..	..	456	..	..	..	83,469	83,469	83,925
1867	..	14,167	..	..	..	3,387	..	..	17,554	..	2,481	..	96,369	98,850	116,404
1868	1,124	13,170	..	..	2,150	3,953	25	414	20,836	50	358	100	59,926	60,434	81,270
6 months of 1869	..	14,363	600	100	4,951	6,678	368	8,192	35,252	..	203	210	101,902	102,315	137,567
	2,778	41,700	600	100	7,101	14,018	393	8,606	75,296	50	3,042	310	385,202	388,604	463,900

Cotton Commissioner's Office, Nagpore,
12th August 1869.

HARRY RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

ment, I am again not very agreeably reminded, that, in this my second Report too, it is not possible to point to any great progress, or to record any very striking results. I trust, however, that it may perhaps be thought that, in a new Department, where the ground is still almost unknown, rapid progress, at first, does not always mean ultimate success, and that solid results may best he ensured by a careful survey of the circumstances of the present, and well-considered plans for the future. Even what little progress it is possible to show has not been made without difficulty; and however slight that advance may appear, each step has had to be anxiously and laboriously cut in the ice rock of a subject almost unknown and unexplored. The decision, for example, that, for the present at least, the improvement of our cotton may best be secured by the careful farming and selection of the indigenous seed, was not arrived at without much inquiry, consideration, and anxiety; and in the decided move that has this season been made in this direction, it will, I think, be generally admitted that we are at last on the right track. From the improvement of all the means of communication with the cotton-producing districts, which has been taken up so warmly by Government, we may, I am confident, look for increased profits both to ryot and to merchant, by which the stability of our trade may be firmly secured. Still, whatever views may be held as to the correctness of these conclusions, this fact at least must, I fear, be apparent to all with whom I am in any way officially connected,—that no Government officer has had more pleasant duties to perform than those which have fallen to my lot; and that no head of a Department has received more thorough and consistent support than that which, from all quarters, has throughout been accorded to me. Whether from my mercantile friends with whom my duties bring me in contact, or from the Divisional and District Officers into whose country my work often takes me, I have always received the greatest sympathy and assistance; whilst, in regard to the Government under which I serve, I would gratefully record that every single recommendation submitted by me, having for its object the advancement of cotton interests, has been most promptly and cheerfully sanctioned. I am then constrained to confess that, for all shortcomings, I am alone, and entirely, to blame; that I have not one single excuse to offer for any failures; and that if I have had to perform not altogether easy duties, those difficulties have been often more than counterbalanced by the liberal support that has always been accorded to me. It has also to be noticed, and the fact is patent to all who have any acquaintance with this part of India, that I made my start in my new appointment with an immense advantage, just as many

circumstances were combining to work a perfect revolution in the cotton trade; and that, having been borne on the advancing tide, the credit of many improvements have by some been very kindly, but erroneously credited to me, with which improvements I have had nothing whatsoever to do, and which must have resulted whether there had been a Cotton Commissioner or not. Still, all these favourable circumstances, which have buoyed me up, are perhaps not to be regretted, if they have given me some confidence, and have enabled me to carry out difficult schemes with less hesitation and faltering than would otherwise have been the case. I can at least say, that the encouragement and support I have received has caused me to take a real interest in the work, which will perhaps not be without its effect on my labours in the future.

193. In conclusion, I would desire to bring to the notice of Government the great assistance rendered to me throughout the year under report by Mr. Alexander Dunlop, recently appointed Assistant to the Cotton Commissioner in the Wurdah Valley. Before coming to me, Mr. Dunlop had had some experience in the cotton trade, and had doubtless inherited from his father some of that interest in the improvement of Indian cotton for which the late Chairman of the Glasgow Chamber of Commerce was so well known. During the year he has been with me, he has carefully superintended several experiments, and by assisting me generally in my office has acquired experience, which will be useful to him in his new appointment. When the Hingunghat seed was required in large quantities for Khandesh, he rendered valuable assistance, and received the thanks of Government for his exertions. The whole of his work has been performed in a manner which renders an experienced Assistant's services particularly valuable: for, not content with carrying out carefully my instructions, he has studied to anticipate my requirements, and has often collected statistics and information which have been of value in the preparation of my reports. I hope that his deserving services may meet with the approval of Government.

Services of Mr. Alexander Dunlop.

I have the honour to be,

Sir,

Your most obedient Servant,

HARRY RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 12th August 1869.

POSTSCRIPT.

As I am anxious that this report should contain the very latest information, I desire to add a Postscript, showing the prospects of the growing crop, and the past and present state of the weather in these Provinces up to date, which has given no small cause for anxiety since I commenced writing this report.

2. For a long time the rain held off; but just as matters were getting most critical, the long-wished-for showers came down, and the crop was saved—on one occasion only just in time to prevent the resowing of a large portion of the crop being rendered necessary.

3. During the past month there has been abundant rain, and prospects are now decidedly favourable. At Khangaon, in West Berar, 25·45 inches of rain had fallen from the commencement of the monsoon up to the evening of the 7th instant; and Captain Wodehouse, the Assistant Commissioner at Khangaon, who has been good enough to furnish me with the latest information on the subject, writing on that date, says:—

The crop in West Berar.

> "The cultivators require about a fifteen-days' break with sunshine and a cessation of rain, and if, after that time, another couple of inches of rain falls, they will have nothing to desire. At present we are getting the sunshine during the day, and it is doing much good; but unfortunately about 10 cents of rain falls every evening, and renders the black soil too wet for any weeding to be carried out, and this is much required. The cotton itself is about the height of an ordinary table, and exceedingly strong and healthy looking. In some few fields, where rubbish and manure have been thrown, the plant is already beginning to blossom. To-day there is nice bright sunshine, and as yet no appearance of rain.
>
> "We had 28 rainy days in August, and every day this week there has been a little, varying from 40 to 10 cents. The total fall to date is 25 inches 45½ cents."

4. Mr. Lyall, the Commissioner of West Berar, who also has obligingly procured for me the latest information in his Division, concurs in this view. He thinks, too, that the crop now wants sun, and notices that the fields look somewhat backward and the plants small; which struck me also on my last visit to Berar; all of which is owing, doubtless, to the lack of rain early in the season. And this may perhaps somewhat delay the appearance of the new cotton in the market.

5. From East Berar, Colonel Nembhard gives an equally favourable report; and in a letter just received, he mentions that—

In East Berar.

"The accounts from all three districts of my Division are excellent. In Woon they have had about 22 inches of rain. In Ellichpore about an average of an inch more. In Oomraotee also about 22 to 23 inches. The young cotton is most thriving: it is in flower, and a good crop is expected unless something unforeseen happens.

"We have not had too much rain, and the weather is fine today, with sunshine and plenty of wind."

6. I am indebted to Captain Ricketts, the Deputy Commissioner of the Wurdah (Hingunghat) country, for the following interesting information regarding the prospects of the crop in that district. After mentioning that he has just returned from a tour through the chief cotton tracts, he says:—

"The cotton crops that I saw were excellent; the best by far are in Hingunghat Tehselee, but those in Arvee and Wurdah have picked up wonderfully with the rain that they have had during August. No more rain is needed for the present towards Hingunghat, but the crops in Arvee and Wurdah could do with 6 or 7 inches more. Sunshine in Hingunghat for the next 12 or 15 days, and a little rain afterwards, would make the crops perfect. I have only noticed the plant looking yellow in a very few places. Speaking of the district generally, I can say from my own personal observation, and from the inquiries I have made, that the cotton up to date is first-rate, and is likely to exceed the out-turn of last year very considerably.

In the Hingunghat country.

"If we were to have now heavy downpours of rain for any length of time in Hingunghat, and no rain or scarcely any about Arvee and Wurdah, the prospects of the coming crop would of

course be much changed; but even then the cultivators would not do badly. This is my third season now in a cotton district, and, judging from the experience of the two past years, and from the distribution of the rainfall during this monsoon, I have every reason to believe that the crop will be an unusually good one."

7. The accounts from the other parts of the Provinces are on the whole good, though the crop suffered somewhat at first in Nimar. But the above are the districts which have a real effect on the exports of cotton from this part of India.

In Nagpore itself, although we are still below our average,—only 25½* inches having fallen up to date,—the rain has been well distributed, and the crops are looking well, though the tanks and wells want more water.

8. At present, then, we have not much to complain of. But one is never quite content, and doubtless fine weather is now wanted, and heavy and continued rain now would do almost as much damage as the want of rain threatened to effect some short time ago. Cotton is a bright cheery, sunny plant, and long damp dull days do not suit it. Seasonable rain, and then warm, clear days, are what it likes. And fine weather is particularly wanted when the plant is in flower, and heavy rain then is likely to damage the petals of the flower and the buds, and the young bolls, which soon begin to form. So we must hope for fine weather now; and our wish seems likely to be gratified. To say the least, the plant, during the past few seasons, has proved itself to be extremely hardy; and even should heavy rain now overtake us, which at present does not appear probable, our former experience of the crop should give us confidence in its facing the unseasonable weather bravely.

9. All my inquiries tend to confirm the opinion expressed on one or two former occasions, that good prices have induced the ryots to extend the cultivation, and that unless some unforeseen calamity should occur a full crop may be expected.

There is much speculation going on in cotton of the new crop. The prices at which bargains for the growing cotton are being made range extremely high.

10. A friend of mine in Bombay has drawn up a Statement contain-

---

* Our average annual rainfall here is 39·75 inches.

ing some very valuable statistics of the cotton trade of that port during the last year, which, with his permission, I append to this Report, as I am confident it will be perused with much interest.

HARRY RIVETT-CARNAC,

Cotton Commissioner for the Central Provinces and the Berars.

Cotton Commissioner's Office, Nagpore, 11th September 1869.

COTTON STATISTICS,

1868-69.

COTTON STATISTICS,

1868-69.

APPENDIX **A.**

Memorandum on some Sites for storing Water for Irrigation in the North of Berar.

Dated Camp, Deodah, Berar, 12th June 1867.

It would, I should think, be difficult to find a tract of country possessing a natural system of drainage more perfect than that part of Berar, which, lying between the Sautpooras and the Adjunta Hills, includes the best cotton-growing lands of the Akola and Oomraotee Districts. In the extreme east of the valley, the country, which here assimilates to that of the Nagpore Province, slopes towards the Wurdah River, into which the streams of the Eastern Pergunnahs of Berar flow. Just beyond Oomraotee, is, what may be not incorrectly termed, the centre of the watershed of this part of India. The Poornah and Taptee, which, flowing westward, fall into the Indian Ocean at Surat, have their rise in the Sautpoora Hills, on the northern boundary of the Oomraotee District, and at no great distance from the source of their sister stream, the Wurdah, which, taking an eastern course, joins the Godavery, and falls into the Bay of Bengal at Coconada. The Poornah and the Wurdah divide between them the waters of the streams of this part of the country. In fact, the lands of some of the villages near Budnaira (the railway station for Oomraotee) may be said to help to feed two Oceans. For in some places, within a few yards of one another, may be seen two streams, of which the one, joining itself with the Wurdah, and then with the Godavery, travels through some 500 miles of, for the most part, wild country, till it reaches the Eastern Coast; whilst the other follows the Poornah and the Taptee through an equally long but less uncivilized course to the Indian Ocean at Surat.

2. To the west of Budnaira and Oomraotee the whole drainage of the valley is into the Poornah. The course of this river is right through the centre of the tract, the two lines of hills above mentioned being about equidistant from the Poornah, and the slope of the country being towards the river. On either bank a perfect series of smaller streams, flowing in a direct line from the hills, and thus having their course at right angles to the Poornah, pour into that river at regular intervals, carrying with them the drainage of the rich village lands through which they flow. As these lands again lie generally

in huge waves of soil parallel to the course of the smaller streams, and at right angles to the river, the drainage of the valley is most perfect; and it is to this circumstance, I believe, that the Berars owe the excellence of the cotton for which these Provinces are so justly celebrated. The annexed very rough sketch will give a sufficiently correct notion of the perfection of this drainage system, and will show that the Poornah is as a centre drain, carried right through this rich garden, the smaller drains being laid out, on either side, with perfect symmetry, and singular regularity and care.

3. To the cotton cultivation, in its present stage, this system of drainage is most perfectly adapted. But the system of streams and water-courses, which nature has provided, seems to be deserving of being regarded in a higher and more important light than as drains to carry off the water from the hills and the village lands.

4. With a little arrangement, and at a comparatively small expense, these water-courses might, I believe, be utilized for irrigation works; and as it is possible that the importance of irrigation to the successful culture of cotton may hereafter assert itself more positively, I would desire to urge the desirability of an inspection being made during the ensuing cold season, with a view to determine whether a system of irrigation might not be undertaken in the Berars, with the prospect of financial success. I would also desire to submit such few facts bearing on the subject as, during a hurried tour through that part of the valley lying north of the Poornah, I have been able to collect.

5. I would first mention that irrigation from wells is carried on extensively and successfully throughout that part of Berar to which I have above alluded, especially in the villages situated just beyond the spurs of the hills. Here the water is near the surface, *i. e.* from 12 to 15 feet; and in the language of one's orderlies, who have seen a good part of Central India, "A man travelling in this part of Berar requires but a short string to his *lotah*" (the metal pot used in drawing water from the wells). Many of the villages have to be approached through narrow lanes, leading between carefully-fenced-in and well-cultivated gardens, in which the betel-creeper, opium, vegetables of many sorts, plantains, and other garden produce, are raised in a quantity sufficient to supply the somewhat luxurious tastes of the now rich peasantry of Berar. The betel-leaf of Julgaum finds its way into the markets far to the south and west, and is even exported across the hills to Boorhanpoor, in exchange for the oil and rich cloths which that town

produces. And, *à propos* of irrigation and garden cultivation, it may not be out of place to mention, that, in the rich days of Berar, roses and other flowers pay as well as any garden-crop that can be raised, and that the cotton peasant, on festive occasions, or on holidays, and at marriage or religious festivals, has been known to pay almost as much for an array of flowers, without which the arrangements would not be considered complete, as would be paid for a bride's bouquet in Covent Garden. For garden cultivation of the kinds mentioned above, the villages near the hills, in the Julgaum and Akote Tehseelees, are famous. The soil is of the kind peculiarly well suited to irrigation, being of a mixed quality, and not so rich as to smother the plant. The wells, sunk apparently in the days of Mahomedan prosperity, are very numerous. Julgaum itself boasts of much fine garden cultivation. The village of Sonagaon, a few miles to the north-east of this town, is one of the sights of the district—nearly one-half of its area being irrigated, and the number of garden plots, amounting, I learnt, to nearly three hundred. From Sonagaon on to Argaon and Akote nearly every village has its gardens and wells. Argaon—in the mangoe-groves and gardens of which General Wellesley's troops had a hard fight of it on the 29th November 1803—is, as its name denotes, "the village of wells" *par excellence;* and Akote itself is equally rich and well cultivated, 150 wells being now in use for irrigation, and most of the houses in the town having wells attached to them. So well supplied, indeed, is this dusty town with water, that the inhabitants find no trouble in watering the road in front of their houses even during the driest months.

6. I have referred to this garden cultivation from wells to show that the soil is suited for irrigation, and that the people appreciate its advantages. But well irrigation is too laborious and expensive, save for a very few crops. I am particularly anxious to draw attention to the natural advantages offered by the physical features of the country for storing water and providing means of irrigation at a comparatively cheap rate. Captain Meadows Taylor, whom no subject of interest or of benefit to the people of Berar seems to have escaped, mentions that the average cost of watering an acre of ground per year for a crop which requires water for a whole year is about 37½ Rupees. This calculation was made some years ago when cattle and labour were much cheaper; and the expense now incurred by the cultivators of North Berar with their garden-crops must far exceed this. The cost of water per acre per year on the Ganges Canal, is, says Captain

Meadows Taylor, about 3 Rupees*; and he goes on to mention that, from calculations made, water stored in an artificial lake on the hills could be sold at a profit, so as to supply irrigation at the rate of *two Rupees per acre per year*, and even less. I believe that water can be stored in Berar in such a manner as to enable the people to irrigate crops to which they cannot now afford to give water, but which could be much improved by irrigation.

7. I have been engaged almost entirely in the open country below the hills, and, save on one occasion, my tour has not extended to the Sautpooras. On a ride across from Gavilgurh to Anjengaon, I passed through a ravine in the hills not far from the fertile lands of Upodekra, where I believe a comparatively small embankment would provide for the storage of a large mass of water in this gorge. From the lie of the hills, I should think many sites could be found where water could be stored and a considerable area of valley-land irrigated. I have, however, already submitted my opinion on this subject more in detail. What I now wish to recommend is the storage of water by means of temporary dams in the rivers in the neighbourhood of villages and towns.

8. A march through this part of the country will convince any one that its physical formation affords great facilities for the construction of inexpensive irrigation works, and the remains of masonry met with in some places show that the importance of this subject was duly recognised by our Mahomedan predecessors. In nearly all the old Mahomedan towns are to be found ruins of extensive water-works. Besides wells and *baolees* innumerable, the remains of embankments across streams are in many places visible. Across the bed of the river, which flows by Julgaum, is the remains of a masonry work, which I think there can be no doubt must have been a dam or *anicut* to store the water of the river during the hot months. The course of a small stream lies right through the town of Jamode, and the Mahomedans took advantage of it to feed a masonry tank, the water of which appears to have been carried by means of pipes for some distance into the town. These works are now utterly out of repair.

9. Further on, near the village of Jasee, I visited at the close of May, in company with Captain Laughton, a stream mentioned by Major Elphinstone in his Settlement Report, which, until comparatively recently, used to be dammed up every year by the villagers, the water being

---

* Lieut. Skipwith tells me the rate for all, save sugarcane crops, is below Rs. 3.

used for irrigating a considerable area of the adjacent lands. Even on the occasion of our visiting the spot,—one of the hottest days of a long dry season,—there was still some water lying in pools along the bed, and if the embankment had only been continued as before, a fine sheet of water would doubtless have been available for irrigation. It is only during the last few years that the villagers have given up the practice of making this embankment. I shall attempt to account for the reason of this further on. On the march to Argaon, several nullahs with narrow beds were passed, which appeared to afford facilities for anicuts. In many of these, patches of water were still to be seen here and there. This could hardly be the remains of rain water, and I should think it probable that these streams were partly fed by "Jherries," or springs, not uncommon at the base of the hills.

10. What was done at Jasee was, I am inclined to believe, done at many other villages; but I had no time to collect detailed information on the subject. To-day, however, at Deodah, the people volunteered an account of what used to be the custom in this village before the Berars came under British rule.

11. To the east of the village is the bed of what, during the rainy season, must be a very considerable stream, for the height of the bank is 24 feet, and the breadth of the bed 160 feet. In old days, said the people, a temporary *anicut* used to be built, towards the end of the rains, at a spot, which they pointed out to me. By the custom of the village, every man at the appointed time lent a hand at this good work, or paid for a substitute. The labour being thus all found by the villagers, the expense of the work was inconsiderable. There remained the cost of material and a few other expenses, the expenses connected with which was, they told me, met by a grant from Government. It seldom exceeded from 200 to 300 Rupees, and went to pay for the piles of wood which were brought from the hills; for cutting and carrying the babool twigs, which, interlaced with the earthwork, formed a sufficiently strong barrier to the stream; and for other contingent expenses. The completion of the work, in which all had some interest, was celebrated by a general holiday and feast. The embankment stood during the cold weather and hot season, and during all those months the townspeople and their cattle had a plentiful supply of water, whilst the stock was liberally used for irrigation. My informants told me that the water used to be carried to a distance of 2 *coss*, or four miles. Although this may be an exaggeration, I have no doubt that the area irrigated was considerable. The country slopes away from the river bank, and water,

if baled up level with the bank, would flow to some distance. The most common mode of irrigation at Deodah, however, appears to have been from wells fed by the river. Near the river-side are, the Pandia reported, 27 of these wells, now useless, which, if an embankment were made, would again be worked. In addition to these there are some dozen wells not dependent on the river, which are worked for garden cultivation; and ten of a similar description now out of repair, but which, if a *tuccavee* advance were given, could again be brought into play. I visited some of these wells, which must have been built at great expense. Their mode of construction and use is somewhat peculiar. The water, apparently, does not percolate sufficiently easily through the soil, and masonry pipes have accordingly been constructed to connect the wells with the river channel. When the river is sufficiently full the water is baled up from it, and conducted in narrow drains through the adjoining fields; but when the river is low the cultivators are dependent on these wells, 37 of which would, however, irrigate much valuable ground. Ten years ago, these wells were used to water rich gardens of sugarcane, and "*goor*" (molasses) was made in considerable quantities at the "*Gannas*," or sugarcane crushing-mills, of which at one time Deodah boasted of nine. Now there is not one single mill at work, and "*goor*," so extensively used by the rich peasantry of Berar, is brought from the great market of Chandoor (not the town on the railway), whence again it has to be imported all the way from Baitool and the Chanda District of the Central Provinces.

12. From what I have said above, it might perhaps be argued that, as the people in former times worked willingly at the anicut, they are evidently sufficiently alive to their own interests, and that their not taking the trouble now-a-days to renew it most probably arises from the fact that the class of irrigation that was formerly practised here no longer pays. But this, they say, is *not* the case, and they assure me that the people have not discontinued this class of cultivation in favour of other and more remunerative crops. If the anicuts were to be rebuilt, the wells would, they say, be worked again immediately. They say that the benefit of the embankment would be great to all; for, putting irrigation out of the question, the advantage of having in the hot weather a breadth of water near the village for bathing in, and for watering the village cattle, would be fully appreciated, and they were confident that all the villagers would work at it again if encouraged. The importance to a village of a good piece of water during the dry season was, they said, immense. Such a village soon became a place

of note, and a plentiful supply of water would ensure its being selected as a market town at which all the people of the country-side would periodically collect. They explain the discontinuance of this useful work in the following manner. As mentioned above, the Government made an annual grant towards defraying the expenses of constructing the embankment. For the last few years this grant has been discontinued. Moreover, they say, Government has not moved in the matter, or taken the lead, as of old. The villagers, they say, cannot carry out the work of themselves, for no one in the village would now-a-days care to take up the scheme, assessing so much on each villager, and inducing them all to lend a hand at the work, as of old. It is, they say, only by some such arrangements, taken in hand by some public-spirited person in the village, that, failing the aid of Government, the work could be carried out, and no one now-a-days would care to incur so much responsibility. Every one, said they, has his enemies, and any attempt by one of their body to induce his brother villagers to renew the work might be misconstrued, and might bring the proposer under the "Penal Code!" This account may or may not be quite correct; but I believe there is considerable truth in what they say regarding the impossibility of this and similar works being carried out unless Government step in to take the lead, to assist and direct.

13. Left to themselves, the people of this part of India appear to be somewhat helpless. However much to their advantage the construction of an *anicut* or any other similar work may be, it is not often they will undertake it of their own accord. They require some one of influence to lead them, and the present system so levels all classes that among themselves there is no one left to take the lead. In old times, the Deshmook was generally a man of authority and weight, and such a scheme might have been initiated and carried through by him. To-day, he is no one. The want of this directing power is perhaps more felt on this side of the Wurdah than in the adjoining Provinces; for there, as a rule, the proprietor of a village would have sufficient influence to induce his tenants to work at repairing an embankment, or at any scheme, the advantage of which to the community was apparent. But even in the Central Provinces the direct action of Government in carrying out works of irrigation is necessary.

14. I have alluded to the case of Deodah at some length, because I wish to show that in former days irrigation was much more in vogue than it now is, and that a cheap means of extending the system exists. I have given the villagers' story of the causes which have led

to the annual works at Deodah being discontinued, because I believe the decrease of this class of irrigation in Berar may to a great extent be accounted for thereby. That this class of irrigation has fallen off is undoubted, but I do not believe that it has been owing to any want of appreciation of its advantage; nor do I believe it to be owing to the land being required for other and more remunerative crops. The true cause may perhaps be found in the fact that Government has not continued its countenance to these schemes as before. Without assistance and guidance, the people, I believe, will do nothing, and it is for this reason that I would particularly urge direct action being taken by Government to revive old schemes for irrigation, and to discover and carry out new ones. If the matter were taken up this season the people at Deodah would, I doubt not, willingly enter into the scheme of rebuilding the embankment. Of the advantage to this large and rich village of a sheet of water, instead of the now dry bed of the river, it is not necessary to say very much. The irrigation works would doubtless be revived. The comfort to the villagers and their cattle would be great, and, as an old cultivator said, the storing of the water in the river would end in the weekly bazaar here doubling in size. Large bazaars are generally held at places where plenty of water is available; in fact, a large concourse of Hindoos, who require so much water for drinking, and for bathing, and for their cattle, could not get on without a plentiful supply of water in the neighbourhood: and hence a village with a well-filled river near it would be sure to be in request.

15. Besides the many sites for storing water in the hills, there is, as pointed out by Captain Meadows Taylor, a narrow passage in the Wurdah near Amnair, where the water of the river might be dammed up in sufficient quantities to irrigate much of the adjoining country. This would be a great and expensive work. But in the rich cotton country lying near the Sautpooras there must be large numbers of points where the small streams could be dammed up and the water utilized in the villages. Near the Sautpooras, the streams, which have their birth in the hills, are yet in their infancy. Here they are tractable and easily guided in a new course, and at a small expense they might be made to take part in a system of irrigation which would render the village lands doubly productive. Considerable difference of opinion exists, I believe, regarding the importance of irrigation in cotton cultivation. But whether irrigation is, as a rule, *necessary* for the cotton plant or not, it can hardly be doubted that on some occasions the application of water to the crop would have a very

important effect on the season's out-turn. A cheap and plentiful supply of water, stored up as suggested above, besides being of inestimable benefit to the surrounding villages, with their large populations and hundreds of heads of cattle, might revive much of the cotton crop of the valley in seasons when, from the failure of the later rains, it would otherwise be doomed to destruction. I hope, then, that on this ground I may be permitted to bring the subject of irrigation in Berar to the notice of the Resident. I fear that the points mentioned above will not be of much assistance in coming to a conclusion on the subject. There can, however, be no doubt that a simple process of irrigation was practised some years ago, and that that system has been comparatively recently abandoned; and I would urge that it would be worth while to cause professional inquiries to be made as to whether this system could not be re-established with the prospect of financial success.

HARRY RIVETT-CARNAC,
Cotton Commissioner for the Central Provinces and the Berars.

Camp, Deodah, 12th June 1867.

APPENDIX B.

Memorandum on Hybridisation.

The following valuable note on Hybridisation was sent to me by my friend, Major Dods, the Director of Public Instruction in the Central Provinces, now on leave in England, who was kind enough to procure for me the information from a friend of his:—

1. Gather a full-blown flower, take a thin sharp knife, and by an upward stroke make a section of the flower and its parts (see fig. 1).

2. Cut off the remains of the two circles of green leaves, the coloured leaves of the flower, and the outer tube or case of the central organ.

3. Observe that the outer tube is crowned with threads more or less drooping, each thread terminating in a roundish hollow body, the anther (fig. 1 B) containing the fertilizing powder or pollen.

4. Each grain or particle of pollen magnified (figs. 2 and 3) is found to contain a cell, and is furnished with two coats or wrappers, whereof the outer one is provided with several thin parts or actual openings.

5. Observe the upper end of the flower stalk (fig. 1 C) is slightly enlarged and supports the ovary formed by the combination of several little bodies (carpels), which become pods or bolls, each of which contains several ovules, from which the future seed is developed.

6. Above the ovaries rises a tube crowned with several threads, each of which is tipped with a mass of cellular tissue-stigma (fig. 1 D), in which are situated the pipes or ducts which descend to each carpel and its enclosed ovule (C).

7. The fertilization of the embryo seed is accomplished thus (see fig. 4). After a grain of pollen falls upon a ripe stigma, the inner coat of the pollen-grain protrudes through an opening in its outer coat, enters the opening of one of the ducts of the stigma, and descends to an ovule in the carpel, which ovule in due time becomes the cradle of a future plant, and storehouse of food for its early plant life.

For the protection of the seed the cotton of commerce is afterwards developed on the surface of the husk or envelope of the matured seed.

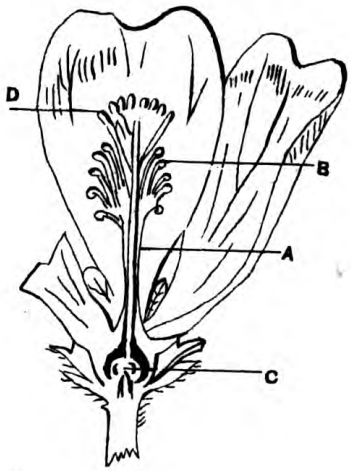
8. Observe the organs of a newly-blown cotton flower, and note how many hours elapse until the others burst and discharge their pollen,

Fig. 4.

Fig. 2.

Fig. 3.

Fig. 1.



and how many additional hours elapse until the stigma becomes ripe and bathed in moisture, and dotted with grains of pollen carried by the wind or by insects.

9. It is noteworthy, that when pollen from another plant is deposited on the ripe stigma of the mother plant along with some of its own pollen, the latter commands the preference: hence, in hybridising, the necessity of removing the anthers before or immediately after the flower opens, and carefully protecting the stigma by a cover of muslin so as to exclude all pollen, except what is offered by the operator.

10. When the stigma are ready for the pollen, dust over them the pollen from the ripe anthers of the flower you wish to hybridise, and at once replace the muslin cover till the flower withers.

11. Flowers subjected to hybridisation are seldom very prolific, but the seeds obtained often produce varieties of great value. The hybrid plants may be used for further experiments in hybridisation, or their individual qualities, partaking of those of both parents, may justify their careful propagation for extensive cultivation.

12. As mother plant, select a bush of vigorous growth, and choose flower-buds just about to expand.

13. The growth of a plant is an interesting study; the selection and production of good varieties of our cultivated garden and field crops in England has brought wealth to many a careful observer, and these principles applied to cotton will fructify commerce in many channels.

14. The plan most likely to produce good varieties is to use the pollen of a long staple foreign variety on the stigma of a healthy indigenous mother plant.

(Signed) A. HEPBURN.

APPENDIX C.

Reports on the Experimental Growth of Cotton in British Burma from Hingunghat Seed in 1868.

From Lieutenant Colonel J. F. J. Stevenson, Commissioner of Arakan, to the Secretary to the Chief Commissioner of British Burma, Rangoon,—(No. 26, dated Akyab, 27th February 1869).

I have the honour to report as follows with reference to the experimental cultivation of the Hingunghat cotton seed, received with your letter No. 155-2 of the 7th July last. I was referred for instructions to the Memorandum of the Cotton Commissioner of the Central Provinces on the cultivation of this particular kind of cotton, which was published in the Supplement to the *British Burma Gazette* of the 4th July 1868.

2. From this Memorandum it was found that we should have received enough of seed to have sown 5 or 6 acres of land for the experiment, as recommended therein—about 60 lbs.—instead of 15 lbs., so that our experiment apparently could not be tried on a sufficiently large scale. It was however too late in the season to apply for a larger quantity.

3. I selected Captain Plant, Deputy Commissioner, Ramree, to try the experiment. It was pointed out to him that from an analysis by the late Mr. Peddington, the soil of Cheduba appeared to be about the same as Sea Island, which is known to produce the finest cotton in the world.

4. I note all this with a view to show that we did all we could to ensure the most favourable experiment possible.

5. On the 4th of last January, Captain Plant forwarded the report of the Extra Assistant Commissioner of Cheduba. It appears that the seed was sown about the 15th of October, in 2 plots of paddy land, where, however, the drainage was free. The seed was first sown in a nursery, and the young plants were transplanted, partly in ordinary ploughed land, and partly in drilled holes.

6. The report says that only one plant made its appearance, but its fate is not noted, nor has the Extra Assistant Commissioner mentioned in what particular plot this solitary plant came up; but he states

that the cultivator was of opinion that the seed was old and not of the previous season, and hence did not germinate.

7. It may perhaps have happened that if the seed had been planted as recommended by Mr. Rivett-Carnac, during the "first break in the weather following the setting in of the rains," the experiment might have been more satisfactory.

8. I would recommend another trial during this year, a sufficient quantity of seed being procured in proper time to allow of three sowings, viz., the first in the first break in the weather at the setting in of the rains, the second about the middle of September, and the third about the middle of October. I think that the middle of September would be the best, as the flowering would then take place about the middle of November, and the cotton be ready to be picked in December. The Madras Cotton Hand Book states that the plant is of rapid growth, requiring humid weather whilst growing, and dry clear weather whilst maturing. It requires eight weeks from date of sowing to that of coming into flower, and about the same length of time from the fall of the blossom to the opening of the pod: so planting in the middle of September will bring the maturing to the end of December or the beginning of January following.

9. But I would suggest that, in making the experiment, the value of the labour, &c. spent should be made good to the cultivator, as otherwise there would not be found any one willing to try it on a scale of 5 or 6 acres for every experiment.

From J. C. HARDINGE, Esq., Honorary Secretary to the British Burma Agri-Horticultural Society, to the Assistant Secretary to the Chief Commissioner, British Burma,—(No. 53, dated Rangoon, 15th March 1869).

With reference to your No. 155-5, in the Financial Department, dated 10th July 1868, forwarding a supply of Hingunghat cotton seed for experimental cultivation in the Agri-Horticultural Garden, I have now the honour to report.

2. After selecting a well-drained piece of ground, measuring 68′ × 100′, to the north-east of the garden, and clearing it thoroughly of grass, the soil was well turned up and loosened by hand labour (mamooties) to the depth of three or four feet, and then ridged up four feet apart; after which, during a break in the monsoon of several

days, on the 24th August 1868, the seed (5 lbs.*) was hand planted two or three inches apart on these ridges, and lightly covered over; they readily germinated on the 30th of the same month, six days afterwards. About the 10th or 12th September, the young seedlings were thinned out, and subsequently grew up very freely, then at an average distance of two feet apart, apparently much invigorated by the showers that fell in September and October, and again for a few days in November, the only labour bestowed on them being occasional weeding of grass and ridging up, which latter the showers washed away now and then. Early in October, the plants, after attaining an average height of three feet, commenced flowering and forming capsules, and, being kept watered daily after the cessation of the rains, continued to grow satisfactorily until the recent very hot weather set in; they have now attained an average height of four feet however, and deducting, say, 10 per cent. for young seedlings that perished in process of thinning and other causes, 687 healthy plants were raised from 5lbs. of seed.

* 10 lbs. of seed was given away to several parties about Rangoon.

3. The nature of the soil where the present experiment is being tried by no means approaches that described by Mr. Rivett-Carnac in his printed Memorandum as the natural soil of the plant, which is a "bluish-black, greenish, or dark" grey clay varying in depth from "two to fifteen feet." Such soil is nowhere to be found in the Society's Garden, nor is there anything approaching it; what was sought for, however, was a *well-drained* locality. The poor soil, composed partly of a dark reddish clay, with a large admixture of sand, was to a small extent enriched by mixing with it about six cart-loads of old cowdung manure; but with the little attention given to the plants, raised as they have been in soil so uncongenial to their proper growth, there is little reason to doubt that, in suitable localities in the interior of the districts, Hingunghat cotton ought to grow as well in British Burma as in its own country; and I will be most willing and glad to place my services at the disposal of the Local Government, should they be required, to conduct further experiments next season in such localities as have been selected for the purpose, of fully testing and encouraging the growth of this excellent description of cotton in this Province.

4. I regret that I did not adopt the process of "rogueing" the plants as recommended by Mr. Carnac; my attention was mainly directed to their growth, and the quality of cotton they would produce. It was found (as noted in the printed Memorandum) that they shot

up very rapidly in September, so much so that they had to be supported with thin bamboo sticks; many of the plants, when measured on the 10th instant, had attained a height of 5 feet.

5. From the plants now growing, I have already obtained about 35 lbs. of uncleaned cotton, but as they are more or less all bearing at the present time, I anticipate that the yield will be over 60 lbs. before the setting in of the S. W. monsoon. I herewith forward a sample of cleaned cotton (picked by the hand) selected indiscriminately from that obtained from the plants; and as I expect to obtain a good supply of acclimatized seed, I will be glad to make over a portion of it for further experiments in the interior, if it is required.

6. As another experiment is now being made with foreign cotton in the Society's Garden, (a variety of Persian, closely allied to the Egyptian,) which grows exceedingly well about Rangoon at all seasons, and yields a fine white cotton of long staple, I may note that the seed of the Hingunghat cotton now obtained, owing to the complete isolation of the experiment, is quite *pure,* a point to which Major Clarke has drawn particular attention in his pamphlet with regard to selection of seed.

From the Officiating Commissioner, Tenasserim Division, to the Assistant Secretary to the Chief Commissioner, British Burma,—(No. 3, dated Maulmein, 17th April 1869).

With reference to your letter No. 155-4, in the Financial Department, bearing date the 7th June 1868, requesting me to experimentalize with 15 lbs. of Hingunghat cotton seed, and forward 12 lbs. weight of the uncleaned cotton, obtained from seed sown in each different kind of soil, to Mr. Rivett-Carnac at Nagpore, I have the honour to report that I distributed 7 lbs. of the cotton seed to the Deputy Commissioner, Amherst District, 4 lbs. to Shwe-Gyeen, 2 lbs. to Tavoy, and 2 lbs. to Mergui. The result, I regret to state, has been a total failure—a few seeds only germinated in some districts, but even those died away. I am inclined to believe that the seed, when received here, was old and useless, otherwise more favourable results might have been obtained.

2. I beg to forward copies of the District Officers' reports on the experiments they made with the seed.

From C. J. F. S. FORBES, Esq., Assistant Commissioner, Thatone, to the Deputy Commissioner, Amherst District,—(No. 1, General, dated 31st March 1869).

I have the honour to report on the Hingunghat cotton seed forwarded for trial as follows:—

I gave the seed to a Shan garden cultivator near Thatone, who planted it at the same time as he had been accustomed to plant the Shan variety.

I also gave to the Phagat Myooke half of a small quantity I received from the Rangoon Agri-Horticultural Society, and planted the remainder myself.

The result has been, I am sorry to say, a total failure; a few seeds only have germinated, but even those died away.

I beg to remark, that, as the rain-fall in the native habitat of this species of cotton does not exceed 40 inches (vide *British Burma Gazette*, July 4th, 1868), while in this district it is, I believe, on the average 240 inches, the plant would hardly seem adapted to this locality.

At the same time, I would draw your attention to the fact that a sample of the ordinary native cotton grown on the banks of the Salween, near Hpagat, which I sent home to a friend in Liverpool, is stated by him to be worth 18*d.* per lb. there.

From LIEUTENANT COLONEL FAITHFUL, Deputy Commissioner, Tavoy, to LIEUTENANT COLONEL RYAN, Officiating Commissioner, Tenasserim Division,—(No. 679, dated 19th March 1869).

With reference to your circular No. 284 of the 11th instant, I have the honour to report that I distributed one-half of the Hingunghat cotton seed among 12 of the best cultivators in the month of August 1868, and they set them in different kinds of soil in the same month, but none of the seeds grew. I made a second trial with the remainder of the seeds in the month of October 1868, and it was equally unsuccessful, not a single seed shot out. It is therefore believed that the seeds were not fresh.

From T. SHEPHERD, Esq., Deputy Commissioner, Mergui, to the Officiating Commissioner, Tenasserim Division,—(No. 168, dated 17th March 1869).

In reply to your circular No. 284, of the 11th instant, I regret to report that the Hingunghat cotton seed sent in July last never ger-

minated, although carefully distributed to the Karens, who are the only class of people who understand the production of cotton in this district.

The seed, when I received it, was old and musty.

From CAPTAIN C. A. WATSON, Deputy Commissioner, Shwe-Gyeen, to the Officiating Commissioner, Tenasserim Division,—(No. 203, dated 23rd March 1869).

With reference to your circular docket No. 74, dated the 14th July 1868, requesting me to experimentalize with 4 lbs. of Hingunghat cotton seed, and to report the result to Mr. Rivett-Carnac, I beg to inform you, that though every endeavour was made to ensure a successful trial, very unusual heavy rains set in shortly after the sowing, whereby the whole of the seed was destroyed. Even had the weather been favourable, I doubt if any success would have been achieved, as the seed was apparently damaged in transit, it having been sent during the rains. Great pains were taken in selecting sites for the experiment. I, however, made a mistake in sowing the whole at one time.

The first sowing of most of the cotton cultivators in this neighbourhood was entirely destroyed, but the second crops turned out well. I request the favour of your allowing me 8 lbs. more of this description of seed, that I may continue the experiment next season.

From the Commissioner, Pegu Division, to the Assistant Secretary to the Chief Commissioner, British Burma,—(Home Department, No. 41, dated Rangoon, 3rd, 1869).

The delay on the part of the Deputy Commissioner of Bassein to send in his portion of the report on the experimental planting of Hingunghat cotton in this Division has kept back this paper till date.

2. With your letter of the 7th July, you sent me a bag containing 15 lbs. of Hingunghat cotton seed. This I distributed, as below, within a week of its receipt, requesting the recipients to sow the seed as a trial and report the result:—

Financial Dept., No. 153-3.

	lbs.
Deputy Commissioners of Districts, each 2 lbs.. ..	10
Secretary, Agri-Horticultural Society	2
Assistant Commissioner, Thayetmyo	2
Extra Assistant Commissioner, Henzadah	1
Total....	15

3. A copy of your letter was also furnished them, and they were informed that any inquiries could be made, either direct to Mr. Carnac or through myself.

4. From the Secretary, Agri-Horticultural Society, I have received a copy of a report addressed direct to yourself. It would appear that gentleman got some seed from you, for the two lbs. I sent him he forwarded on to Mr. Forbes, the Assistant Commissioner at Thatone, not in my Division. The success or otherwise of the experimental sowing there, will probably be made known to you through the Commissioner of the Tenasserim Division.

5. The seed sown in the Agri-Horticultural Garden appears to have afforded satisfaction. On an average from 130 to 140 healthy plants were raised from each pound of seed; and Mr. J. J. Coles Hardinge, the Secretary, anticipated that before the setting in of the S. W. monsoon, the yield would be some 12 lbs. of cotton from one of seed.

6. The two pounds I gave Captain Lloyd came to nothing. The seed was distributed by him to a few people about the town of Yandoon, to be planted by them in the gardens; but nothing came of it.

7. From Bassein, as I have noticed, there has been no report whatever.

8. Lieutenant Gower, for the Deputy Commissioner of Myanoung, has sent in a report, from which I am sorry to see that the trial in his district has been a complete failure.

9. The Burmese were unwilling to devote any time or attention to it, and so it was made over to some immigrant Shans.

Owing to the unfavourable nature of the soil where it was sown, the yield was only 11 ounces of cotton, or 5½ ounces to each pound of seed.

10. Two pounds of seed which I sent to the Extra Assistant Commissioner at Henzadah, Moung Kyawdoon, he had planted by cultivators in the Kwengouk circle of the Ookpho township, in his Division. Owing to heavy rain, however, the young plants were all killed.

11. Captain Street's account of what was entrusted to him will be found in his report. I am very sorry that even here there should have been want of success.

When I was, many years ago, Deputy Commissioner of Prome, I remember having cotton seed sent to me, of two or three kinds, for

experimental planting, and I had it carefully sown in my own garden and the adjacent grounds.

There was no room whatever to doubt of the soil there being favourable, and that cotton cultivation would be a success.

The plants came up so thick, that they were a perfect jungle.

The late Captain D'Oyly, my Assistant, who afterwards officiated as Deputy Commissioner at Prome, reported on the crop when it had fully grown (year 1858), and it was evident that had there been only some one who understood the proper management of the plants, the yield would have been most satisfactory.

12. The Assistant Commissioner, Thayetmyo, considering the season to be too late for sowing the cotton seed, has reserved it till this year.

13. The Toungoo Deputy Commissioner's report shows that the seed furnished him, he was informed, rotted and came to nothing.

14. I regret very much to be obliged to send in so fusionless an account of the seed sent me.

15. It is evident from both what I have seen myself in Prome, of the vigour with which the young plants shot up, and from the satisfactory account sent up by the Secretary to the Agri-Horticultural Society, that cotton is a plant that, fairly treated, will thrive well in the country; but against this must be placed the fact that paddy pays better than cotton, and as long as it does the Agriculturist will not give up the former to cultivate the latter.

From the Deputy Commissioner, Myanoung, to the Commissioner of Pegu,—(No. 24, $\frac{\text{Foreign.}}{\text{Revenue.}}$ dated Myanoung, 21st April 1869).

I have the honour to submit the following report on the trial of Hingunghat cotton seed, 2 lbs. of which was sent to me with your docket circular No. 72, dated 13th July 1868.

2. It was received here 5th August, and made over to Assistant Commissioner, Myanoung, for trial in his Division.

3. On referring to the Memo. on Cotton cultivation, published at page 96, Supplement No. 12 of *British Burma Gazette*, 4th July, he found that this cotton is usually sown in the beginning of the rainy season, that it flowers in September, and is picked in November. It seemed therefore that no time should be lost in getting it into the ground, but at this time of year (August) no Burmans could be prevailed on to try it; it was accordingly made over to some Shans living on the high land

near Myanoung; the instructions contained in the Memo. were translated for them, and the ground was prepared under the superintendence of the Myoma Thoogyee. The soil however, light and sandy, was unfavourable to cotton, and though all the seed came up the plants were very poor, none being more than 1 foot 6 inches high, and grew very slowly: the cotton was not picked till December and January, when only 11 oz. of cotton and seed were obtained.

4. The trial has so far been a complete failure.

5. It might succeed better in other parts of the district, but, looking to what is stated in the Memo. above referred to, I am of opinion that the experiment should be made by some Government official, say the Deputy Conservator of Forests, and that it should be made with not less than 50 lbs. of seed. I do not think any cultivators will be induced to experiment with it on a sufficiently large scale, or to pay the requisite attention to it to give it a really fair trial; but if Government leads the way, and shows that it can be successfully cultivated in Burma, and yields cotton of superior quality, its introduction will be easy.

From the Extra Assistant Commissioner, Henzadah, to the Commissioner of Pegu,—(No. 4, dated 21st May 1869).

In reply to your letter No. 318, dated the 15th April 1869, and with reference to the circular No. 74, dated 13th July 1868, calling for a report on the result of the Hingunghat cotton seeds experiments, I have the honour to inform you that the seeds alluded to were made over to those who had ripe experience in the indigenous cotton plantations of the country.

The seeds were given out at the beginning of October last, with full instructions, as far as could be obtained, and to be sown on the spots selected in Kwingouk circle in the township of Ookpho of the Henzadah Division: it appears that the country cotton seeds were always sown in previous years in the said circle.

The report or information sent in by the Thoogyee shows that the land was prepared by ploughing with country instruments (rough hoes) by the country cultivators, and sown according to the best judgment of their experience.

The cotton seeds were sown in regular rows about 4 feet apart; most of the seeds were in a successful state, and the plants were found to shoot out rapidly, with the exception of a few damaged ones; but owing to there being an unusually heavy fall of rain in the country, the young trees were found not so healthy as anticipated.

From the inquiries made on the state and progress of the cultivation, many experienced old cultivators gave their opinion that the trees died owing to the incessant fall of rain, otherwise they would have grown to full size and borne a full crop.

I further beg to state that I know the season of the plantation of the Burmese cotton is generally about the latter end of September and beginning of October, therefore I am confident that the plants did not die for want of due care and perseverance on the part of the cultivators.

In conclusion, I regret that the report was not sent in due time, owing to negligence on the part of the Thoogyee, who was a long time away from his circle up at Myanoung for the settlement of revenue affairs.

From the Deputy Commissioner, to the Commissioner of Pegu,—(No. 563, dated Prome, 19th March 1869.

I have the honour to enclose herewith the report on Hingunghat cotton, drawn up by my predecessor, Captain C. W. Street.

Seed was not received until very late in the season. Cotton is generally planted just at the beginning of the rains.

This was sown on the 12th September in some very rich soil, and the plants appear to me to be coming up well. Some goats, however, got in to the enclosure and ate down the whole of the plants.

(Signed) C. W. STREET,
Deputy Commissioner.

From the Assistant Commissioner, to the Commissioner of Pegu,— (No. 122, dated Thayetmyo, 27th April 1869).

I have the honour to acknowledge receipt of your reminder No. 318, dated 13th April 1869, calling attention to your Office circular No. 72, dated 13th July last, regarding Hingunghat cotton seed. The circular was received on the 27th July, but the packet of seed did not arrive till the following steamer in August, at too late a period of the season to plant it out.

I inquired from the Myooke *(Extra Assistant Commissioner)* on the subject, who informed me that the cotton in the Toung-yas was always planted in June, and that it would be useless attempting to experiment with the seed this season.

The packet of seed has been carefully preserved, to be distributed to one or two cultivators in June of the present year. At the end of the season a report will be submitted on the subject.

From the Deputy Commissioner, to the Commissioner of Pegu,—(No. 1, dated Toungoo, 6th April 1869).

I have the honour to report upon the experiment of the cultivation of Hingunghat cotton in the Toungoo District. The seed received from you last year was distributed among a few respectable cultivators in the four circles.

2. The cotton was sown in the months of October and November, in a black loam soil near the banks of the river and other streams. The attempt, I am sorry to say, has been attended with failure throughout. The cultivators state that the seed rotted away; whether it got damp in transmission here, or whether the soil affected it and caused it to rot, it is impossible to say.

3. From information I have collected, I find that experiments of this kind have been tried on several previous occasions, but with no success worth mentioning. The few plants that have come up, have never arrived to any maturity.

4. On account of the incessant failure, the cultivators don't care to go to the trouble of sowing it.

5. With regard to the cotton used by the Burmese, there are two sorts, the white and the red cotton. The red cotton is however seldom or never sown.

6. The cultivation of cotton in this district has increased considerably during the past year, 1868-69, the number of acres being 217 against 138 in the year 1867-68. This increase is to be accounted for by the high price which is obtained by the requirements for a greater demand.

7. Some of the cotton is grown near the river banks known as "Keing," and some on the hill "Toungya." The "Keing" cultivation is however found to thrive the best, as the soil is more moist.

8. The cultivators are taxed at the rate of eight annas per acre, and they sell the cotton at Rs. 20 per hundred viss.

9. The largest portion of the cotton cultivation is carried on in the Zeyawaddie Circle, the number of acres being 142; the Bombaddie

Circle being 144 acres, the Thagarah Circle 29 acres, and in Baunee 2 acres.

10. The reason of more cotton being cultivated in the Zeyawaddie Circle than any other, is to be accounted for by the fact—1*st*, that it is found to thrive in that part best, the soil being much more moist being in a valley; 2*nd*, that it is nearer to Kyouk-gyee and Shwe-Gyeen than the other Circles.

11. Most of the cotton produced in this district is sent away to Shwe-Gyeen and Kyouk-gyee, a higher price being obtainable there than in this district, as it appears that the cotton cultivation in the Shwe-Gyeen District is not sufficient for the supply of the market.

APPENDIX D.

Experiments with Hingunghat Cotton Seed in the North-West Provinces.

No. 812 of 1869.

From W. C. PLOWDEN, Esq.
Secretary to the Board of Revenue,
North-Western Provinces,

To R. SIMSON, Esq.,
Secretary to the Government,
North-Western Provinces.

Dated Allahabad, the 26th July 1869.

Revenue.

Present.
H. S. Reid, Esq.

Sir,—I am directed by the Board of Revenue to submit the report on the experiment with Exotic cotton seed in the year 1868, promised in para. 2 of their No. 486, dated 2nd July 1868.

2. The following in an abstract of the Reports received by the Board.

3. *Boolundshuhur.*—The Collector distributed the seed supplied him to five persons. Of these, only three tried the experiment, as the seed arrived too late; and of these two only—Mr. J. G. Robertson, Assistant Settlement Officer, and Syud Mehrban Ally, Raees of Golaotee—have reported the result of their experiment. Syud Mehrban Ally sowed 8 seers of seed in 1 acre, 1 rood, 20 poles of land on 12th July 1868. The land was prepared as usual. The crop was watered 8 times. The first watering was given 24 days after sowing, and the subsequent waterings at intervals of from 8 to 11 days. The crop produced 9 maunds 38 seers of uncleaned cotton, which gave an out-turn of 3 maunds 10 seers in cleaned cotton. The cotton is whiter and finer than native cotton, but produce much less. The plant was suddenly attacked by the disease called "cheepa," which made the leaves yellowish and sickly looking. Mr. Robertson sowed 1 seer of seed in

1 acre 1 rood of land, which had been ploughed twice and manured slightly. The crop was watered three times in August and twice in September. It produced 24 seers of uncleaned cotton, which gave 6 seers and 3 chittacks of cleaned cotton; the seed arrived much too late for a favourable experiment.

4. *Moradabad.*—A small quantity of seed was sown in two beegahs of land in the Government Garden on 16th June 1868. The crop was watered six times to the close of February 1869, and weeded as occasion required. The total expense incurred was Rs. 12-4-0. The crop yielded 30 seers of cotton, the value of which at the market rate amounted to Rs. 6.

5. *Mynpoory.*—Dr. Tyler, Civil Surgeon, reports that, owing to the late sowing and the drought, the experiment was a failure. He forwards a report of the Agri-Horticultural Society of Calcutta on samples of Hingunghat and Sea Island cotton grown by him. Mr. F. N. Wright, C.S., sowed 1 seer of seed in 1 village beegah of land. The soil was a medium between "Boor" and "Domut." The seed was sown in the month of Sawan, and in consequence of deficient rainfall was watered many times. The total out-turn was 25 seers of uncleaned cotton. The staple is strong and silky, but the labour required to bring it to perfection puts it far beyond the reach of any cultivator.

Mr. Martin, Indigo Planter, received the seed too late in the season. He says that he has been regularly sowing all descriptions of exotic cotton (both American and Egyptian) for the last five years. The produce from exotic seed per beegah is nearly the same as of the indigenous staple, and when proper care is bestowed in pruning and weeding, it is much larger. Like the indigenous plant it flourishes best in Bhoor, or sandy soil, and when sown late in the season is subject to the attacks of caterpillars. In the second year the produce is greater than in the first, the quality of the cotton is also improved, and the plant is much stronger and able to withstand the drought and frost.

6. *Furruckabad.*—The Collector states that the reports received from the Tehseeldars show that in consequence of the unfavourable season last year, the seed supplied them was either not sown, or, if sown, was totally destroyed.

In the Jail some seed was sown in 6⅓ biswas of "Domut" land well manured from the Jail Privies. The yield was 113 lbs. in uncleaned and 28 lbs. in cleaned cotton.

7. *Etawah.*—The experiment was tried in pergunnahs Etawah, Bhurtna, and Bidhoona. In the two latter it was a complete failure. In pergunnah Etawah 20 seers of seed were sown in 33 beegahs of Burrooa Chahee land. The expense incurred was Rs. 147-11-6, *viz.*—

Compensation for value of—

Standing crop	Rs.	9	0	0
Ploughing	„	14	0	0
Sowing	„	11	0	0
Irrigation	„	66	1	6
Weeding	„	24	8	0
Supervision	„	4	0	0
Picking kuppas	„	5	0	0
Land rent	„	14	2	0
		147	11	6
Yield of kuppas, 6 maunds 23 seers at the market value	„	32	0	0
Excess expenditure ..	„	115	7	6

The Collector attributes the unsatisfactory result obtained to want of rain.

8. *Banda.*—The experiment was tried in nine different places in the district. The average out-turn per acre was 12 seers 4 chittacks against 15 seers 13 chittacks of country cotton, and the proportion of seed to cleaned cotton was slightly in excess of two-thirds. The staple is undoubtedly longer, cleaner, and more glossy than the country cotton, but the plants require more care than the cultivators of the Banda District will bestow on them.

9. *Futtehpore.*—The seed arrived too late in the season, and the cultivators declined to try the experiment. In pergunnah Kora, however, 8 beeghas and 18 biswas of land were sown, but, owing to the indifferent season, the experiment proved a failure. The results were as follows:—

In	5	beghas	18	biswas seed did not germinate.
„	1	„	13½	„ plants dried up.
„	1	„	6½	„ nine seers of cotton were obtained.

10. *Humeerpore.*—Seven seers of seed were sown in 1 beegah 9 biswas of Purooa land in the Collector's compound. The crop yielded 695 lbs. of coton in pod and 175 lbs. of cleaned cotton.

In pergunnah Humeerpore $3\frac{3}{4}$ seers of seed were sown in 1 beegah 8 biswas of Purooa land. The crop yielded 264 lbs. of cotton in pod, and 84 lbs. in cleaned cotton. In pergunnahs Raat, Punwaree, and Mahoba, the plants grew to a height of six inches, and then withered away. In pergunnah Moudha the seed did not germinate.

11. *Jounpore.*—The experiment was tried in the Jounpore Fort. Twenty-four seers of seed were sown in 2 acres, 2 roods, 15 poles of Mutteear land. The yield obtained was 18 maunds 20 seers kuppas to 5 maunds 11 seers of cleaned cotton. The cost of the experiment amounted to Rs. 114, while the value of the out-turn exceeded Rs. 160. The staple is good, superior to that of country cotton, and of a better description than the Hingunghat cotton.

12. The Superintendent of Dehra Doon and the Collectors of Moozuffernuggur, Saharunpore, Shahjehanpore, Agra, and Cawnpore, report that the seed arrived too late to try the experiment.

13. *Muttra.*—The seed arrived too late for distribution.

14. *Bijnour and Budaon.*—The experiment was a failure in these two districts.

15. The above summary of replies from District Officers shows that the experiment, like that of the Hingunghat seed, was made under unfavourable and trying circumstances.

16. The seed was distributed at too late a period of the season. The late sowing rendered the plants particularly liable to attacks from caterpillars (as proved by Mr. Martin's experience).

17. When a crop was raised, the whole was fine, and finer than the ordinary produce of the country. Mr. Wright, Assistant Collector, Mynpoory, remarks, however, that though the staple is strong and silky, the labour required to bring it to perfection puts it far beyond the reach of any cultivator—the staple of the cotton produced in Jounpore was good, and superior to that of country cotton, and of a better description even than Hingunghat cotton.

18. Sufficiently definite information is not furnished by the Government Officers and the gentlemen who have experimented with the cotton seed to enable the Board to institute a comparison between the out-turn of exotic and of the ordinary cotton. Mr. Martin, in the Mynpoory District, who has had considerable experience in cotton cultivation, writes that the produce from exotic seed is nearly the same as

that raised from the indigenous seed, but if proper care is bestowed in pruning and weeding it the yield is much larger.

19. No less than 8 District Officers reply that the exotic seed reached them too late for distribution and a fair trial of experiment.

20. The Board would solicit the attention of the Lieutenant Governor to paragraph 6 of their letter No. 813 of this day's date, the recommendations therein submitted in regard to future trials of the Hingunghat cotton seed being of course equally applicable to experiments in American seed.

I have, &c.,
(Signed) W. C. PLOWDEN,
Secretary.

No. 813 OF 1869.

FROM W. C. PLOWDEN, ESQ.,
Secretary to the Board of Revenue,
North-Western Provinces,

TO R. SIMSON, ESQ.,
Secretary to the Government,
North-Western Provinces.

Dated Allahabad, the 26th July 1869.

SIR,—I am directed by the Board of Revenue to submit, for the information and orders of His Honor the Lieutenant Governor, the accompanying abstract of reports on the experiment with Hingunghat cotton seed during the year 1868.

REVENUE.
Present.
H. S. REID, Esq.

2. The Hingunghat cotton seed has had scarcely a fair trial. The distribution took place when the season was too far advanced. The season, moreover, was unfavourable, owing to the general prevalence of drought. In one instance, the failure of the crop is attributed to heavy rain; in the Bareilly District the plants suffered severely from frost.

3. The cotton, when the experiment resulted in a crop, is favourably spoken of, in regard to quality. Mr. Powell, of Shahjehanpore, pronounced it to be far superior to the cotton of the district. The Col-

lector of Moozuffernuggur states that the fibre is far superior to that of the country cotton, and is much admired by cultivators. Mr. Michel, of the Meerut District, reports that the heaviest of the bolls were not a bit larger than those of the country cotton, though of a longer staple, and much more silky in feel and appearance. The Superintendent of the Botanical Gardens at Saharunpore pronounced the quality to be good, the fibre being longer, softer, and thinner than that of country cotton. Mr. Haworth, of Agra, reports very favourably of the Hingunghat, and gives it the preference over the New Orleans cotton. The Hingunghat cotton produced in the Public Garden at Benares proved to be cleaner and more glossy, and to possess finer fibres, than country cotton. The cotton grown at Etah was softer and more silky than the ordinary kind, and longer in staple. Doctor Dutt, of Lullutpore, reported the cotton produced to be stronger in fibre and more glossy, and to make better thread than the ordinary cotton of the district. On the other hand, Mr. Dunne complains that the Hingunghat cotton was shorter in staple than the produce of the indigenous plant, and Mr. Sturt, of Jhansie, reports that the description of cotton was in no way better than that ordinarily known in the district.

4. There can be no doubt of the superiority of the Hinghunghat cotton over the produce of the common country plant of these Provinces, as regards the quality of the yield. But with regard to the comparative quantity of the yield, the information from the different districts does not afford sufficient grounds for arriving at a definitive and certain conclusion.

5. Mr. Powell, of Shahjehanpore, considers the yield would be much the same as from the ordinary crop grown. The Collector of Banda reports that the yield bears favourable comparison with that from country cotton seed, the average out-turn of cleaned cotton from the former being 24 seers 5 chittacks, and of the latter 15 seers 13 chittacks. The smallness of the out-turn in Moozuffernuggur is attributed to the late arrival of the seed, and in the Bhoolundshuhur District to the seed being sown in shaded land. The out-turn of the seed sown in the Saharunpore Botanical Garden appears to have been far below the usual yield raised from country seed. From the detailed report it is clear that the experiment was a total failure as regarded its affording any satisfactory grounds for a conclusion as to the ordinary out-turn of Hingunghat seed.

6. But the experiment undoubtedly justifies the belief expressed by the Commissioner of Allahabad, that the description of cotton would

be found suitable to these Provinces, and would be extensively cultivated (the Collector of Moozuffernuggur notes that it is a favourite with cultivators). The Board would recommend that early measures should be taken to ensure the distribution of a sufficient supply of the seed by the end of May at the latest; that equal quantities of Hingunghat and of country seed be sown in contiguous plots of the same size and of the same quality of soil; that both be treated alike in every way regarding watering, manuring, weeding, &c., and the results carefully reported. Mr. Webb, of the Meerut District, correctly describes the object of the experiment made by Government as being to ascertain under equal given condition of soil and cultivation the comparative value of two descriptions of cotton.

I have, &c.,

(Signed) W. C. PLOWDEN,
Secretary.

Abstract of reports received in reply to Board's Reminder of 20*th March* 1869, *on the result of the experiments made with Hingunghat Cotton Seed during* 1868.

Collector, Shajehanpoor.—Mr. Powell, of the Rosa Factory, reports that he received the seed when the season was far advanced, and at a time of continued drought. The seed was sown—

Some in the garden. Soil composed of good mould, yearly enriched by fresh stable manure.

Some in an open khet. Stiff soil composed of clay and sand.

Some in a small plot of ground near the garden. } Light soil, manured with stable manure and wood ash.

The garden soil gave plenty of wood, but matured no pods.

The stiff land did not bring the plants to maturity.

The small patch near the garden yielded stem about two feet high and an abundance of pods.

Cotton far superior to the cotton of the district. Return per acre would be much the same as the yield from the ordinary crop grown.

Mr. Gardener, of the Mewnah Factory, reports that the seed came too late in the season. Shall be glad to give it a fair trial if the seed could be got in good time, *i. e.*, not later than the end of May.

Collector, Banda.—The yield from the Hingunghat cotton seed bears favourable comparison with that from country cotton seed. The

staple of the Hingunghat cotton is finer and brighter than that of the country cotton, and the average out-turn of cleaned cotton per acre of the former is 24 seers 5 chittacks, and of the latter 15 seers 13 chittacks. The crop from the Hingunghat cotton seed, however, had the advantage of irrigation.

The proportion of seed to cotton was the same in the yield from the Hingunghat as from country seed, viz., 1 seer of cotton to every two seers of seed.

Commissioner, Meerut, No. 271, *dated* 29*th March* 1869.—*Dehra Doon, Saharunpore.*—The seed was received too late for sowing.

Moozuffernuggur.—5 seers of seed were sown in 1 beegah 13 biswas pucca of canal-irrigated land. The land was watered once, and then ploughed five times, and a dressing of manure given. The seed was sown on the 30th June and 2nd July, in ridges at intervals of two feet. It was watered one week after it was sown, and again three times at intervals. It was weeded four times. In the first month the plants attained a height of 9 inches, in the third month 2 feet, and at the end of October 5 feet. The yield in clean cotton was 5 lbs. and in seed 11 lbs. The smallness of the out-turn is explained by the seed having arrived too late. It should have been in the ground by the beginning of June, whereas it did not arrive till the 22nd of that month. In October cotton plants of all descriptions were attacked by an insect which damaged the buds. The past year's experiments must not therefore be taken as a criterion—the Collector states that the fibre is far superior to the country cotton and is much admired by the cultivators. Specimens of the seed and cleaned and uncleaned cotton accompany Commissioner's report.

Meerut.—The Collector received the seed too late to sow in 1868, and has stored it carefully for trial next year. The result of the experiment made by Mr. J. Michel, of the Dasnah Factory, with some seed sent to him direct by the Board, was not satisfactory. Mr. Michel reports that the greater portion of the first lot of flowers dropped off without forming the bolls; some few did, but fell of after a few days. All the after flowers remained on, and the plants produced cotton till the end of November, in which month the bolls were very much smaller. The heaviest of the bolls were not a bit larger than those of the country cotton, though of a longer staple, and much more silky in feel and appearance. A great portion of the bolls were attacked by a small red worm, a quarter of an inch long, which eats through the cotton into the bud, staining the cotton a dirty reddish colour. The Collector has

seen the cotton produced, and thinks it is very silky and of superior length of staple. He adds, that no importance must be attached to the results of the first trials, and that another season's experience will give a better chance of success.

Boolundshuhur.—Five seers of the seed were sown at Secundrabad close to the Tehseelee in one acre of fair "Bara" land, and 5 seers in one acre of land in the experimental garden in Boolundshuhur. Five maunds of uncleaned cotton were gathered at Secundrabad, and only 2 maunds 13 seers at Boolundshuhur. The out-turn of clean cotton in both cases comes to close upon a quarter of the weight of uncleaned cotton. The smallness of the out-turn in the Boolundshuhur garden is attributable probably to the land being too much shaded. The Collector of Allygurh transferred the seed sent to him by the Board to the Collector of Agra.

Superintendent, Botanical Gardens, Saharunpore.—Two seers and two chittacks of the seed were sown in 3 beegahs 12 biswas of rather light and slightly sandy land.

The yield was 70 lbs. 10 ozs. in uncleaned cotton and 15 lbs. 4 ozs. in cleaned cotton. Samples of both are submitted. The quality is good, the fibre being longer, softer, and thinner than that of country cotton. The experiment was not a fair one, as the seed arrived too late.

Mr. A. P. Webb, Meerut.—Mr. Webb reports on *Dharwar* cotton. It is presumed this is a mistake, as the Board supplied him with *Hingunghat* cotton seed. Under this presumption an abstract of his letter is given here, the words "*Hingunghat*" being substituted for "*Dharwar*." Mr. Webb sowed equal areas of Hingunghat and ordinary cotton on contiguous plots and in soil of the same character. The Hingunghat received one watering more than the country seed. Both suffered from the subsequent drought, but the Hingunghat was almost totally destroyed. The proportion of seed to cotton was greater in the Hingunghat than in the country, quantity for quantity. In the Hingunghat from 45 to nearly 50 per cent. In the country from 35 to 40 per cent. as usual. The pods ripened quicker in the country cotton. Mr. Webb found this same delay in ripening in 1864 with new Orleans cotton seed sent him by Dr. Cannon from Lucknow.

He adds—"I cannot concede that the unlooked for interposition of drought interfered with the general results of my experiment. The object was to ascertain under given equal conditions of soil and cultivation, &c., the comparative value of two descriptions of cotton, and the Hingunghat has failed."

Collector of Jounpore.—States that the whole out-turn from the Hingunghat seed sown last year was 4 maunds 20 seers of cotton in seed, from which the yield of cleaned cotton was 1 maund 10 chittacks. The yield was good in comparison with that of country cotton.

Collector, Mirzapore.—States that he has submitted his report through Commissioner.

Collectors, Moradabad and Budaon.—No experiment was made, as the seed arrived too late. It has been kept for experiment next year.

Collector, Bareilly.—The experiment was carried out in four different places.

In the Public Garden at Bareilly 4 chittacks of seed were sown in one beegah of light loose soil slightly covered with sand. The seed was sown on 26th September. Most of it germinated and came up well, but on the 7th, 8th, and 9th January 1869, 70 per cent. of the plants were frost-bitten. Those that survived are nine and eleven inches high, and are beginning to flower.

The Reverend Mr. Thomas sowed some seed (quantity not stated) in cultivated garden soil, but owing to very heavy and early frost the plants did not come to maturity.

The Tehseeldar of Buheree sowed half seer of seed in 8 biswas of Domut soil. It germinated, but was destroyed by frost.

The Tehseeldar of Pillibheet sowed 1 seer of seed in 1 beegah of Domut soil. He obtained 14 seers of uncleaned cotton. He has given no return of the yield in cleaned cotton, but has been called upon to do so.

Collector of Agra.—States that the season was much against the success of the experiment, and, excepting in the public gardens, his own garden, and in a plot of the Sowad Shahar Muhal, where there were facilities for irrigation, the sowings made by Zemindars were destroyed by the drought.

The Collector forwards samples of the cotton in seed, and cleaned, with Mr. Haworth's opinion. Mr. Haworth reports very favourably of the Hingunghat cotton, and gives it the preference over New Orleans cotton.

Collector of Bijnore.—No experiment was made, as the seed arrived in August, much too late for sowing.

Collector of Etawah.—Ten seers of seed were sown in 10 beegahs of Burrooa Chahee land, at a cost of Rs. 41-0-8, as follows:—

Compensation for value of standing crop ..	Rs.	3	0	0
Ploughing	„	5	0	0
Sowing	„	3	0	0
Irrigation	„	17	4	0
Weeding	„	6	4	0
Land rent	„	6	8	8
	„	41	0	8
Market value of 3 maunds	„	15	0	0
Loss Rs.		26	0	8

In spite of every effort to preserve the crop, want of rain injuriously affected its growth, and the experiment proved a total failure.

Deputy Commissioner, Jhansie.—Of the ten seers of *seed* received by him, the Deputy Commissioner sent 5 seers to Mr. Sturt, Assistant Commissioner, for trial in the Nursery Garden at Mhow, and 5 seers to Dr. Tressider for cultivation in the Jail Garden.

The fate of the seed sent to Dr. Tressider cannot be ascertained, as that officer fell ill and was obliged to go to England.

Mr. Sturt reports that the plants came up well, but were stunted and ran to pod too early from want of rain. The description of cotton was in no way better than that ordinarily grown in the district.

Collector of Mynpoory.—Of the ten seers of seed which he received, the Collector sent 2½ seers to Dr. Tyler, and distributed 1½ seers to each of the five Tehseeldars of his district. The Tehseeldar of Shekoabad, the only one who has submitted a report, states that, with the exception of ¼ seer of seed sown in 5 biswas of land, which produced 5 seers of good cotton, all the rest dried up and came to nothing.

Dr. Tyler reports that he sowed the seed in the middle of July, which was much too late; the crop suffered subsequently from drought, and the out-turn was far short of what he expected. Dr. Tyler is of opinion that all foreign cotton should be sown in or about April, and reared by well water, so that with the rains it should mature, and be flourishing and fructifying by early spring. He encloses a report by the Agri-Horticultural Society of Calcutta on samples of Hingunghat and Sea Island cotton.

Muttra.—The experiment was undertaken by the following persons:—

Mr. Blewitt, Sitolea; Nuthoo Lall, Sahar; Boodh Singh, Omergurh; Sirdar Ally, Hyatpore; Jankee Pershad, Royah; Goolab Singh, Sooray; Pirthee Singh, Moujee Lall, Irshad Ally Khan, Dowlut Singh, Kullian Singh, Government Garden.

Boodh Singh, of Omergurh, sowed 1½ seers of seed in 13 biswas of Barah land. The crop yielded 21 seers in uncleaned and 5 seers 4 chittacks in cleaned cotton.

Pirthee Singh sowed 2 seers of seed in 16 beegahs 10 biswas of Chicknata Moujah land, and obtained a yield of 1 maund 10 seers in uncleaned and 16½ seers in cleaned cotton.

Irshad Ally sowed some seed in Bhoorbarah land, which yielded 1 seer of kuppas and 3 chittacks of cleaned cotton.

These are the only results given. The experiment was a total failure in all the other cases, owing chiefly to late sowing and want of rain.

Furruckabad.—Two lbs. of seed were sown in 2¾ pucca biswas of Domut land, well manured in the District Jail. The produce obtained was 67 lbs. 4 ozs. of uncleaned and 18 lbs. of cleaned cotton.

In the Central Jail 4½ lbs. seed were sown in 10 pucca biswas of Domut land, not manured, and yielded 28 lbs. uncleaned and 9 lbs. cleaned cotton.

Mr. Elliott sowed some seed in 1 biswa of land in his own garden, and obtained a yield of 24 lbs. 6 ozs. of uncleaned and 5 lbs. 6 ozs. of cleaned cotton.

The seed sown in the public garden entirely failed.

Azimgurh.—The experiment was tried by Mr. Cooke, of Doobaree, Mr. Dunne, of Shumshabad, and by the Secretary Public Garden.

Mr. Cooke reports that, owing to the drought, the plant was attacked by small caterpillars, which completely destroyed the blossoms as they appeared, and consequently the yield was nothing at all.

Mr. Dunne sowed 8 lbs. of seed in 1 beegah 14 biswas of sandy land, and obtained 135 lbs. of uncleaned and 30½ lbs. of cleaned cotton. Mr. Dunne says that he considers the cotton produced inferior to the ordinary country cotton, as it is shorter in staple, whilst at the same time the yield is no more than usual, though it requires more than the ordinary labour.

The Collector adds that Azimgurh is not a cotton-growing district, and he agrees with Mr. Dunne that any further experiments are useless.

In the public garden 1 seer 9 chittacks of seed were sown in 3 fields containing 10 biswas of light alluvial, well-manured land. The produce obtained was 116 lbs. uncleaned and 23¾ lbs. cleaned cotton.

Benares.—Baboo Shiva Pershad sowed 4 seers of seed in 1 beegah 10 biswas of Bulwa land, but the experiment turned out a total failure, in consequence of the heavy rain which fell immediately after the seed was sown.

The result of the experiment in the public garden is as follows :—

3¾ seers of seed were sown in 2 biswas garden land, 1st quality.
19 ,, ,, ,, ,, 2nd ,,
18 ,, ,, ,, ,, 3rd ,,

The yield obtained was—

10 lbs. kuppas from 1st quality land.
90 ,, ,, from 2nd ,, ,,
60 ,, ,, from 3rd ,, ,,
136 ,, kuppas yielded 32 lbs. cleaned cotton.

The cotton is cleaner and more glossy, and possesses finer fibres, than country cotton.

Baboo Doorga Pershad sowed three seers of seed in 15 biswas of Mutyar land in mouzah Imlia, pergunnah Kuttehur, and 2 seers in 10 biswas of the same description of land in mouzah Itwa, pergunnah Sheopoor. The latter entirely failed. The crop in mouzah Imlia yielded 140 lbs. in kuppas and 28 lbs. in cleaned cotton. The yield is below that of country seed, but the cotton is cleaner, the fibres are finer, and the seeds are smaller and less in number, than in the country cotton. In 5 seers of Hingunghat kuppas there were 4 seers of seed, while in the same quantity of Munooa (country) kuppas there are usually 4½ seers of seed.

Mirzapore.—The experiment was tried by Mohunt Jairamgir and Buchoo Lall Pauray, and by Mr. D. C. Halket in his own garden. In all three instances the out-turn was next to nothing, though what was produced was very fair cotton. The failure is attributed to the lateness of the sowing and the unusual dryness of the season.

Ghazeepore.—Owing to drought the experiment in this district was an entire failure.

Lullutpore.—The result of the experiment tried in this district is not promising.

Mr. Greenwood, Extra Assistant Commissioner, obtained only 5 seers of kuppas from 1½ lbs. of seed sown in one-fifth of an acre of loose black mar with a light mixture of sand and manure.

Shewram Doss obtained 2 seers of kuppas from 5 lbs. of seed sown in ¼ acre of Domut.

Native Doctor Rambuccus Ram obtained 12¼ seers kuppas from 4½ lbs. seed. Dr. Dutt was more successful in his experiment. He sowed 5 lbs. of seed in ½ acre of Domut land, and obtained a yield of 2 maunds 33¾ seers in kuppas, and 24 seers 1 chittack in cleaned cotton. Dr. Dutt reports the cotton produced to be stronger in fibre and more glossy, and to make better thread, than the ordinary cotton of the district.

Etah.—Five seers of the seed were sown in 1 beegah 13 biswas of "Domut Khakhee." The produce obtained was 4 maunds 28 seers of kuppas. Five seers of the kuppas were cleaned in the Jail with the following result:—

	Srs.	*Chk.*
Cleaned cotton	1	5½
Seed	3	7
Waste	0	3½
Total...	5	0

In consequence of the drought and the seed being sown too late, quite half the crop was lost. The cotton is much softer and more silky than the ordinary cotton, and longer in the staple. The kuppas was sold to Etah Jail at Rs. 5 per maund.

The cost of cultivation was as follows:—

Cost of manuring	Rs.	1	5 0
Ploughing, &c.	,,	1	10 0
Weeding	,,	2	11 0
Irrigation	,,	12	9 0
Picking cotton	,,	1	13 0
Rent of land	,,	3	12 3
Total...	,,	23	12 3
Price of 4 maunds 28 seers kuppas, @ Rs. 5 per maund	,,	23	0 0
Loss.....	Rs.	0	12 3

(Signed) W. C. PLOWDEN,
Secretary.

APPENDIX E.

Correspondence with the Chamber of Commerce, Madras, regarding the Improvement of Cotton.

CHAMBER OF COMMERCE,
Madras, 7th July 1869.

FROM C. A. LAWSON, ESQ.,
Secretary, Chamber of Commerce,

TO H. RIVETT-CARNAC, ESQ., C.S.,
Cotton Commissioner, Nagpore.

SIR,—The subject of Cotton adulteration has recently been very prominently brought before the notice of this Chamber, and has led to the revival of questions connected with the improvement and extension of cotton cultivation in this Presidency. The Bombay Chamber in a recent letter have testified in an emphatic manner to the very important services that have been rendered by you in promoting the improvement of the staple shipped from Bombay, and this, coupled with what the Madras mercantile community have from time to time learnt of your proceedings from your own excellent Reports, and from the complimentary notices of your services in the public prints and the Bombay Chamber's Reports, must be this Chamber's excuse for venturing to solicit for the cotton interests of Southern India the benefit of your practical and varied experience of the most feasible means that should be adopted in this country, with the view of encouraging the growth and improving the quality of cotton.

It may be useful to you to know, that this Chamber have always been averse to the extension to this Presidency of the Cotton Frauds' Act, and have always held the opinion that the best possible remedy against the adulteration of the staple is found, not in police deterrents, but in a resolute rejection by merchants of all cotton that does not come up to the standard which it purports to be. In the long run it is felt, the evil of adulteration is ruinous to all concerned, and it may be fairly assumed that this evil might be effectually overcome, were there

a Department whose mission it was to study to promote the lasting interests of cultivator, middle-man, and buyer.

In 1861, the Madras Government, in declining to accede to this Chamber's proposal, that Captain R. N. Taylor, of the 17th Regiment N. I., should be employed to report on the means of improving the communications between cotton-producing districts and the ports of shipment, as well as upon the best means of improving the quality and increasing the quantity of the staple, took occasion to say in their order of the 21st May, that "the direct interposition of Government in operations purely agricultural and mercantile was beginning to prove prejudicial alike to the producer and merchant." Further, that "the most politic course for Government to pursue is to restrict their operations to the improvement of communications, and leave the increased production of any particular article to be brought about by the natural stimulus of enhanced demand and greater profit." Since the date when these words were written, the attitude of the Local Government towards cotton interests has in no material degree been changed, and at the present moment, as you are doubtless aware, the exertions of the Revenue Authorities are not supplemented by those of a Department like your own, which confines its attention to questions intimately connected with cotton alone.

The experience of many years, and your thorough knowledge of the capabilities and necessities, not alone of your own field of labour, but also of all cotton-producing districts in India, will, the Chamber believe, enable you to express an authoritative opinion as to the expediency of this Government departing from the strictly neutral position in which they now stand with reference to the staple. And should you be of opinion that advantages over-balancing the incidental expenditure may fairly be looked for, the Chamber would esteem it a great favour if you would oblige them with your views for the introduction of a scheme of operations adapted to the extent of our cotton trade and producing capacities. The Chamber regard it as essential to convince the Government that the advantages referred to are neither of a speculative nor of a one-sided character, the interests of buyer and seller being alike involved. They would then describe in the clearest terms in their power the exact functions of the Cotton Commissioner and of his subordinates, and the principal objects that should have his and their habitual attention. A most material consideration would be the contingent expenditure, and looking to the limited area of the Madras

cotton fields, and the comparatively moderate, though increasing exports of the staple from the whole of Southern India, the Chamber feel that the Government are not likely to give the subject their favourable consideration unless the estimated cost of the Establishment is placed on as economical a basis as is compatible with efficiency.

I have the honour to be,
Sir,
Your most obedient Servant,
C. A. LAWSON,
Secretary.

COTTON COMMISSIONER'S OFFICE,
Nagpore, 16*th August* 1869.

MY DEAR MR. LAWSON,

My letters of the 19th ultimo and 14th instant will have explained to you the causes which have all combined to delay my answer to the letter which, in the name of the Chamber, you were so good as to address to me on the 7th ultimo. I trust to you to be so kind as to explain these reasons to the Chamber, and to assure them of the great pleasure I feel in now being able to communicate my views on the important subject on which they have done me the honour to consult me.

I must premise by reminding you, that I am almost entirely ignorant of the position and prospects of the Madras Cotton Trade. What little I know of it, I owe to Mr. Talboys Wheeler's valuable book, and to the good nature of some of your cotton merchants, who showed me the cotton-screws, and permitted me to bore them with sundry questions, when I passed through Madras last March. I am thus hardly in a position to offer you any advice, and I think that, instead of proposing measures for your adoption, it will be better that I should mention briefly what has been done, and what it is proposed to do, in this part of India, and leave you to judge how far the circumstances of our Provinces resemble those of Madras, and how far our remedies are likely to suit your wants.

The objects your Chamber has in view, are, I understand (*a*) to check the adulteration of cotton, and (*b*) to extend and improve the cultivation of the staple.

To effect the first object, *i. e.* to check the adulteration of cotton, measures, both direct and indirect, have been adopted for some time past

in our part of India. By direct measures I allude to the Cotton Frauds' Act. The indirect measures are those, which, by improving the general tone of the trade, lessen the inducement to adulterate the cotton, on which inducements continuance of the fraud mainly depends.

As regards the Cotton Frauds' Act, I must mention that the two Departments, *i. e.* the Cotton Frauds' Preventive Department and the Department for the Improvement of Cotton Cultivation, have always been separate in these Provinces, as, until recently, was the case in the Bombay Presidency. Indeed, the Cotton Frauds' Act (Act IX. of 1863 of the Bombay Government) is not in force in the Central Provinces, although, as will be explained in a later paragraph, its extension has been recommended. The Act is in force in the Berars, having been made applicable to that Province by an order of The Vice-Roy in Council. But the power of inspecting and seizing cotton is vested in the Deputy Commissioners (corresponding with your Collectors), and not in the Cotton Commissioner, who exercises no authority whatsoever under the Act. I cannot thus pretend to have had much experience of the working of the Act, but as it has been stated, more than once recently, that I am opposed to its provisions and to its further extension, I would refer you to paragraph 131 of my last Annual Report, in which the extension of the Act to the Central Provinces is distinctly recommended, which is perhaps the best answer to the objection to the old Act with which I have been credited. It may be desirable, however, that I should explain the grounds on which the measure was recommended, so that you may be able to judge whether your position in any way resembles ours, and whether, like us, you require the assistance of the Act.

In favour of the Act, it is generally admitted that the state of affairs in Bombay rendered legislation absolutely necessary to prevent further injury to a trade on which the prosperity of this part of India mainly depends, and which has certainly done as much to improve the position of the cultivator of the Poornah and Wurdah Valleys, as it has to enrich the European merchant, for whose sole benefit the Act is most erroneously supposed by some to have been framed. The balance of testimony, so far as my judgment goes, is, on the whole, in favour of the good that has resulted from the working of the old Act, and there can be little doubt that to repeal that Act at the present moment might have the most unsatisfactory effect of leading the people to suppose that the Government no longer objected to the system of adulteration. Our trade is almost entirely with Bombay. Our cotton is

purchased by Bombay firms, and shipped from that port. An Agent purchases one day in the Berars, where, as already explained, the Act is in force, and the next day crosses the Wurdah River and buys at Hingunghat. When he passes the boundary, and enters the Central Provinces territory to which the Bill has not been extended, he evades the provisions of the Act. Now, dove-tailed as our trade is into that of Bombay, it is highly inconvenient that any difference should exist in the laws which regulate trade in this common cotton field, and it is obviously desirable to assimilate the practice of the courts as much as possible, and for this reason it appears necessary that the law regarding the adulteration of cotton, which prevails in the Bombay and Berar markets, should be adopted in the Central Provinces. And lastly, it could hardly be considered as a demerit that the extension of the Act would provide us with a share of the Cotton Fund, raised by means of a tax of 3 annas a bale, levied on our cotton, in common with all the cotton exported from Bombay, in the benefits of which fund we have not as yet participated. From this fund, a staff of officers, to assist in the inspection of cotton and the improvement and extension of the cultivation, would be provided, and a general fund would be at the disposal of Government for carrying out all measures having for their object the encouragement of the trade. For all these reasons it appeared desirable that the old Act should be extended to the Central Provinces, and its extension was recommended accordingly.

You will be able to judge how far these circumstances coincide with the position of the Madras trade, and whether, by the adoption of the Act, you are likely to share the solid advantages which we hope to secure. But, even should you decide that the Act is not required in Madras, you will not, I am confident, assume that, for that reason, its extension to our territory is equally unnecessary. For I need hardly remind you that the circumstances of the various parts of India are so widely different, that what might succeed in the Madras Presidency, might perhaps be quite ineffectual in our Provinces; whereas the trade of Bombay may require even more stringent measures and more elaborate rules than those which would suit the wants.

But, whilst crediting the Cotton Frauds' Act with certain merits, I have always held that there are influences at work in these Provinces which are quit as powerful to prevent the adulteration of cotton as the stringent provisions of the Bill. This view I express with reference solely to the part of the country in which I serve, and of the circumstances of which I may be supposed to possess some knowledge,

and regarding which I have perhaps acquired some right to speak. These influences and their effects I have attempted to describe in the concluding chapter of my Report for the year 1867-68, to which allusion has already been made, and a copy of which accompanies this letter for facility of reference. During the last two or three years, a great revolution has taken place in the manner in which our trade is conducted. As good fortune would have it, I joined my appointment just as these changes, caused chiefly by the arrival of the railway in our Provinces, were beginning to be felt, and to my exertions, improvements, which must have resulted, whether there had been a Cotton Commissioner or not, have been very kindly but erroneously credited. Every one in this part of India can see well enough how these changes have been brought about, and it would have been absurd for me to have endeavoured to take to myself the credit of them. Hence, the attempted description of the causes which have all combined to improve the quality of the cotton sent down from this part of India. In drawing your attention to this subject I am particularly desirous to preclude the possibility of my remarks being understood, or of their being taken to apply to the circumstances of other parts of India with which I have no official connection.

You will see then that, in my opinion, the most successful means for preventing adulteration is to bring the cultivator and the European purchaser of cotton into direct communication. The European Agent now comes into the market and pays a high price for good cotton, whereas he will not touch inferior or adulterated stuff, save at a considerable reduction below the prevailing rate for good cotton. The system of examining and sampling the *dokra*, or loose bag, in the up-country markets is so thorough, that there is not much chance of "false packed" cotton passing unchallenged. The ryots now have good reason to know that they will be paid according to the *quality* of the article they bring to market, and as there is a better demand for pure cotton than for inferior stuff, it really does not pay them to mix dirt with good cotton, which, in its pure state, is certain to fetch a good price, and to run the risk of getting but half price for the mixture. The cotton once in the hands of the European Agent there is no fear of *his* adulterating it. He has his constituents to please, and his reputation as a skilful cotton-sampler to keep up. He selects then the best cotton he can get, and the steam-press, close at hand, packs the bale, binds it securely with iron bands, and precludes the possibility of it being tampered with on its journey from the up-country market to the manufacturers' premises in Europe. The more

generally this system, which is still imperfect, and has yet many difficulties to battle with, can be extended, the better prospect is there of enlisting that powerful agent, self-interest, on our side, and making it militate against adulteration. And the moral I would desire to draw from the above remarks is, that, on the perfecting of the means of communication in the interior, and on the removal of the many difficulties which now beset the path of the European merchant in Central India, we must depend quite as much for the prevention of the adulteration of cotton as on any other means which it may be within the power of Government to adopt.

Such, at least, has been my experience, and believing firmly in this remedy, I have, under the instructions of Government, busied myself in ascertaining what arrangements could best be made to facilitate the means of communication with the cotton districts; and the construc- of branch railways, the opening out of roads, and the improvement of telegraphic and postal communications, and other similar measures have been steadily urged.

So much in regard to the prevention of the adulteration of cotton. In the cause of the improvement of, and the extention of the cultivation, the measures mentioned above, having reference to the improvement of communications, will, I believe, be found equally valuable. For the demand for good cotton, and the high price which good cotton ensures, whilst teaching the cultivator that it does not pay to adulterate his cotton, at the same time induces him to bestow more care on the cultivation of his crop, and to extend it as far as his means will admit. In our Provinces, many causes tend to limit the extension of cotton cultivation, notably so the rotation of crops, and the excellent and time-honoured system of growing *jowaree*, or millet, the food crop on which the cultivators and their cattle depend, in quantities sufficient for home consumption. But, besides extending the area sown with cotton, the supply may, of course, be largely increased by improving the outturn of cotton per acre by means of more careful cultivation. Our chief difficulty is that such improvements require capital, which is not always forthcoming. But the chief obstacle is the listlessness and apathy of the native cultivator. His wants are so few, and the present price of cotton supplies his wishes so fully, that he has, at present, no very great inducement to bother himself about more careful cultivation, which entails extra work and trouble. The people, however, are not slow to adopt improvements, the merits of which are clearly demonstrated to them, and which possess, what in their eyes is, the

chief element of merit, very little extra trouble, and thus we look for success in the system of selection of seed and other agricultural measures, which are now being adopted in this part of India. But above all things, the absolute necessity of demonstrating clearly to the people the merits and advantages of the improvements we recommend has asserted itself, and to meet these requirements a system of model farms has been adopted. Measures for greatly increasing the out-turn of cotton to the acre by the help of irrigation and manure are now under consideration, and I have great hopes that if water is brought home to the ryot he will gladly use it, and that our cotton crop may thereby be largely increased. But for a more detailed account of this and other projects, I must refer you to my reports, in which the subjects are treated at length, and copies of which are regularly supplied to your Chamber.

It must also be mentioned that endeavours are made to keep the mercantile community informed, by means of the reports issued periodically from this office, of the state and prospects of the crops, the exports of cotton, and the general condition of trade in these Provinces. Lastly, the instructions of Government are, that it is the duty of the Cotton Commissioner to watch, protect, and advance, so far as he legitimately can, the interests of the trade in these Provinces, and, by keeping himself in constant communications with the mercantile community, to ascertain how these objects can best be secured. And every endeavour is made to carry out these instructions as completely as possible.

I have attempted to give you briefly above a slight sketch of the measures which the Government have adopted in this part of India to obtain the objects which your Chamber is, I understand, now anxious to promote. I must leave it to your Chamber to judge how far similar measures would suit the circumstances of your Presidency. On this subject I cannot venture, (as you have done me the honour to suggest,) to advance an opinion, for I know but little of the Madras Presidency, and, under any circumstances, it would hardly be becoming in me to discuss a subject of which the Government of Madras must be the best judge. But I would mention that, so far as I can learn, the advantage of entrusting to a special officer the duties to which I have referred is now generally admitted. If it be advanced that the duty of ascertaining the requirements of the trade, of teaching the ryots the advantage of more careful cultivation, and other like measures, can best be left to the local officers, I would answer that, in this part of the country, where the Deputy Commissioners are overwhelmed with work,

the presence of a special officer to assist and advise them in the improvement of cotton, is supposed to have had some benefit; and if it be urged that the mercantile community are quite capable of taking care of themselves, and to protect and advance their own interests, I would mention that, in this part of India, which, until recently, was almost a *terra incognita* to Europeans, save to the few Government Officers employed here, many merchants have been so good as to admit that their labours have occasionally been lightened, by having a special officer at hand to whom they could apply for information, or assistance, in the clearing away of the many difficulties which, until recently, have beset the path of up-country trade. Doubtless, however, when affairs have settled down more, any benefit that may now be found to result from this portion of the Cotton Commissioner's duties will be much reduced.

As regards Establishment, regarding which you make inquiries, I may mention that, until recently, what was called the "Cotton Department" in these Provinces consisted of myself and three copying-clerks. In May last, three Assistants were appointed to the charge of the seed-gardens and experimental farms, and for each such farm a special officer is certainly necessary. And whilst on this subject I may note that I believe it is much cheaper in the end to employ one officer to watch carefully an experiment, than to spend money in a dozen places on experiments entrusted to persons who have no time to devote to them, and which experiments are not always fruitful in results.

I hope the above information, such as it is, may assist you in coming to some conclusion regarding the measures that might be suited for Madras. I regret that I am unable, from my but slight acquaintance with the Presidency, to arrange my remarks in a more useful form, but I would assure you that it will give me great pleasure to answer any further inquiries, or to supply any information which I may have it in my power to give, and, generally, to do my best to assist the Chamber in attaining the important ends they have in view.

I remain,

Dear Mr. Lawson,

Yours truly,

(Signed) HARRY RIVETT-CARNAC.

To C. A. LAWSON, Esq.,

Secretary to the Chamber of Commerce, Madras.

APPENDIX F.

APPENDIX F.

Description of some of the physical features of the Tracts in the Central Provinces in which the Waste Lands available for sale are situated, taken from the Administration Report of J. H. Morris, Esq., B.C.S., Chief Commissioner.

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated—in British or Native Territory.	Prevailing soil, minerals, and products.
Mountains and elevated tracts.	The most prominent mountain ranges in these Provinces are the Sautpooras, south of, but running parallel with, the Nerbudda River from east to west from its source on the table-lands of Ummerkuntuk, on the eastern frontier of Mundla, to its exit on the westernmost borders of Nimar. From Ummerkuntuk, 3,328 feet above the level of the sea, the most eastern point in the range, an outer ridge runs south-west for about one hundred miles to a point known as the Salee Tekree Hills in the Bhundara District; thus forming as it were the head of the range, whose tortuous length, narrowing as it proceeds westward, and diversified by broad table-lands, low-lying valleys, dorsal ridges and rugged peaks, terminates on the western frontier in these Provinces at the famous hill fortress of Asseergurh in Nimar. The total length of the range may be said to be 300 miles, with an average breadth of about 60 miles, making the entire mountainous area about 18,000 square miles. Some of the highest points in the range are :—	The entire range, except 215 square miles forming the Mukrai State, is in British territory, and comprises the Civil districts of Mundla, Seonee, Chindwarra, and Baitool, with parts of Nimar.	*Soils.* The prevailing soil is basaltic, called "regur," "kabur," &c., formed by disintegrated trap, which commences at Ummerkuntuk, and forms the plateau of Seonee, Chindwarra, and Baitool. The trap is over large tracts of country overlaid by laterite.

Chilpee	2,600	feet	above	sea-level.	
Rajadhar	2,480	,,	,,	,,	
Chowradadur	3,320	,,	,,	,,	
Karinjia	2,696	,,	,,	,,	
Khamla	3,700	,,	,,	,,	Baitool.
Dhoopgurh	4,000	,,	,,	,,	Hoshungabad.

The slope of the range is, in the Mundla District, mainly towards the north; a succession of table-lands leading down to the basin of the Nerbudda; in the Seonee District the slope of the country from the confines of Chindwarra to a line drawn due north and south through the ghat range, which is parallel to the valley of the Bunjur River, is from north to south. Between that range and the valley of the Phen River it is from south to north. On the whole there is a fall from east to west. Proceeding westwards into the Chindwarra District the slope is mainly towards the south. In the Baitool District the conditions are somewhat the same, the main chain of the Sautpooras lying to the extreme north, with extensive rolling plateaux descending into the low country on the south. The Mooltye plateau in this district is the watershed of the Taptee, the Wurdah, and the Bail Rivers, the former flowing westwards along the southern base of the Sautpooras, during their continuation into Nimar, and beyond the latter flowing south and south-east into the plains of Nagpore.

The geological structure of the range is very complicated. At the base, exposed in the beds of the various tributaries of the Nerbudda, especially the Seeta Riva, the Towa, and the Machna, are found the rock series called by the Geological Survey the "Lower Damoodas." They are also exposed on the southern slopes of the range, at Oomrait near Chindwarra, on a small affluent of the Pench. They belong to the coal measures of India, and are distinguished by a preponderance of simple fronded ferns. Overlying these in several localities, both north and south of the Nerbudda, are other strata yielding coal. More extensively spread are the Mahadeva Rocks, which form the great mass of the Puchmurree Hills. They contain a few fern stems, and are remarkable for bands of coarse iron ore passing irregularly through them. Their age is supposed to be the upper Cretaceous. Above these are found the beds which have been called the Taklee series, which follow the same course along the northern face of the Sautpooras as the carbonaceous strata. They include sandstone, red shales, argillaceous

Minerals.

Iron ore is found in many places in the Mundla District, especially in the eastern portions. It is worked in numerous villages by a class of people called "Aggureas," and is sent to market in a very crude state. Limestone is abundant, and charcoal can be obtained where the ore is found. In Seonee gold is found and washed in small quantities in the Bunjur River by a class of people called "Soonjbirs." Iron is found in the valleys of the Mahra and Ooskal, and mica or talc in the Bunjur Valley. In Chindwarra

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated —in British or Native Territory.	Prevailing soil, minerals, and products.
Mountains and elevated tracts — continued.	limestone, and green and purplish clays. The trap formation mainly constitutes the table-lands of all the four hill districts. With the metamorphic rocks it is in many tracts overlaid by laterite. The different plateaux and valleys may be thus briefly described. In the Mundla District there are four principal upland valleys, each sending down a feeder to the Nerbudda; to the west lies the valley of the Bunjur; in the centre the valleys of the Halone, the Phen, and the Bormeyr; to the east the valleys of the Khurmeyr, Chirkar, and Seonee; and to the north-west the valley of the Suljee. The eastern valleys have an elevation superior to those of the west. The portion of the district east of the Chirkar River is an exceedingly rich and highly culturable plain. The western and southern sides of the district between the Khurmeyr and Bormeyr Rivers present a rugged mass of bare and lofty mountains hurled together by volcanic action; the general formation being basaltic intermixed with laterite, with which the higher peaks are capped. There is a lofty range of hills between the Chirkar and Khurmeyr. The country between this range of hills and the Nerbudda forms the talooka of Rameepore, which contains an area of about 217 square miles. It is an undulating plain, watered by numerous streams, but almost entirely destitute of trees and shrubs. On the east of this volcanically-formed country several fine "dadurs" or plateaux, and rich valleys, especially those of Soneteerat and Kurmundul, occur. These valleys are well watered, and sheltered from the winds; and here, even in April, the streams are fringed with verdant grass. The Chowradadur plateau, with an area of about six square miles, is probably one of the most favourable spots for a European settler in the whole Mundla District. This plateau overlooks the Lumnee Valley, situated at the extreme eastern corner of the district on the south side and beyond the ghat range. It forms a sub-talooka, and contains about 100 square miles. The valley is filled with dense jungle, and contains only two or three Bygah villages. It is the resort of wild buffaloes, and of all kinds of deer and beasts of prey. It is entirely		coal exists in several places in the Pench Valley. The mineral is also found in the Baitool District along the beds of the Machna and Towa Rivers, but not so as to give promise of profitable working. *Products* (1) *Forest.* Lac, tussa silk, cocoons; gums, edible and medicinal; honey, wax, wild arrowroot, roots and barks used as dyes and for tanning; the kaunsa grass, which yields a medicinal oil;

uncultivated, and it is thought would prove a good site for a coffee plantation. The Bunjur Valley, running partly into the Seonee District, has two large open plains at Baihur and Bheemlat well watered. The Halone Valley is approached from the Bunjur Valley by the Gara Ghats, which form the eastern margin of the Bunjur. At Bichia it opens into a fine open and fertile plain, some 15 miles long by 5 broad. It is even better watered than the valley of the Bunjur. The valley of the Bormeyr resembles that of the Khurmeyr above described. It has a general elevation of above 2,500 feet above sea level, and has a pleasant climate. The Googree Talooka is a portion of the lower part of the valley of the Bormeyr. The Mowye is a talooka considerably to the east of Googree, and contains the remains of former very extensive irrigation works. About Mowye there are said to be 120 tanks, some of considerable size, but all out of repair. The Thondah Talooka lies to the west of Bichia, consisting of low hills and elevated plains and valleys. North of the Nerbudda the largest talooka in this district is Shahpoor. The country is even more hilly and less watered than that to the south. But there are some fine open plains in the neighbourhood of Shahpoor, at Shahpoorah, and at Niwas. In the Seonee District, the plateaux of Seonee and Lucknadown have a varying height of from 1,800 feet to 2,200 feet well cultivated and clear of jungle. The valley of the Bangunga may be said to commence after the confluence of the waters of the Bangunga and the Thanwur. It is of ever-varying breadth, widening into bays of considerable extent, anon it is contracted by spurs from the hills which run almost to the river's bank. The first basin includes the Bhunsa Bhar forest, unreclaimed. The second bay includes Thema and a part of Mhow, and is about 5 miles across, and well watered. The third basin includes Nursingha, and is here of considerable extent and well watered. South of this basin the hills run parallel to, and at a short distance from, the banks of the river until the embouchure of the Ooskal and Nahra Rivers, where the fourth basin occurs. The Paraswara plateau separates the valleys of the Bangunga and the Bunjur, and has a general width of between 6 and 10 miles well watered. The Phen Valley is more open than the Halone, to which it is nearly parallel. The valleys of the Ooskal and Nahra are narrow, but in one or two places there are open plains. In the Chindwarra District the principal upland valleys are those of the Pench and Kolbira. In many places they present broad open plains about Chand, Chindwarra, and Chowry, highly cultivated and well watered. The general elevation is about 2,200 feet. Less open are the valleys which follow the course

bunslochun, a crystallized salt found in the bamboo, and believed to be a febrifuge. These are more or less common to all the four districts on the range.

(2) *Agricultural.*

The agricultural products of these uplands are similar to those of the plains. Wheat and rice are the principal crops raised; sugarcane is largely cultivated in all four districts; but the opium cultivation is peculiar to Chindwarra and Baitool. The field cultivation of the potato in the Chindwarra District is worthy of mention.

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated—in British or Native territory.	Prevailing soils, minerals, and products.
Mountains and elevated tracts—continued.	of the Kunhan River through Deogurh before its descent into the plains. The plateau of the Puchmurree, 3,500 feet above sea level, is said to be 12 square miles in extent. The scenery is of surpassing beauty and variety. Through the centre of the plateau there flows a fine clear stream for the greater portion of the year, which appears at one time to have been bunded for the storage of water. The plateau presents many advantages for the establishment of a sanitarium, and is easily reached on the north from Bhunkheree, a railway station 35 miles distant. On the south it is separated from the great Sautpoora chain by the valley of the Deinwa. Another plateau, the Mohtoor, 3,200 feet, though somewhat inferior in some respects, has many of the characteristics of the higher Puchmurrees as a sanitarium, and is easily accessible from the south. And lastly, in the Baitool District, the Machna and Sampni Rivers traverse a broad level basin of rich soil, whereon is situated the chief town of Baitool. It is shut in by abrupt lines of stony hills on all sides but the west, where it is bounded by the deep valley of the Taptee. It is almost entirely under cultivation. The Mooltye plateau is, on the south, of considerable extent, and noted for its cultivation of opium and sugarcane. The only plateau at a high level in this district is the hill of Khamla, in the south-west corner of the district, said to be a little below 3,700 feet, the general height of the Gawilgurh Hills, with which it is connected. The absence of water on the plateau must prevent its being selected as a sanitarium, however desirable it otherwise may be as a place of residence, being as it is out of the reach of hot winds.		
	The principal ranges in the Jubbulpore District at the head of the Nerbudda Valley,* are the Bhaner, the Kymore, and the Bhitreegurh. The Bhaner range enters the district in the neighourhood of Heerapore, and forms the northern boundary of the valley of the Nerbudda, and its affluent, the Hirun. The highest peak is Kaloombur, 2,544 feet above sea level.	Wholly in British territory.	* *Soils.* In the valley of the Nerbudda black loamy soil prevails, in other

The Kymore range runs nearly parallel with the Bhaner, and in close propinquity, attaining a height of 2,300 feet. South of the Nerbudda the district is broken up by spurs of the Sautpoora range. Besides these there are detached groups of hills, *viz.*, the Suttee Pahar near Sleemanabad, the Bijooa Hills in the Sehora Tehseel, the Nagur Hills on the borders between Jubbulpore and Mundla, and a low range called the Kynjooa in Bijiragogurh.

The other mountainous and elevated tracts of the Central Provinces may now be briefly described. A portion of the Meikul range skirts the frontiers of Mundla and Jubbulpore Districts on the north-east, and merges into the Sautpooras at Ummerkuntuk. From this terminal ridge a section of the Vindhya range runs along the northern boundary of Belaspore, till it enters the Chota Nagpore territory on the east. Nowhere in this district does the range attain a higher elevation than 2,000 feet. The Laffa Hill, belonging to this range, is, however, over 3,000 feet high, and possesses an area of table-land three square miles in extent, with the remains of ancient habitation. After reaching Korba, a low range runs south into the district eastward of the Husdoo River till the hills reach the valley of the Mahanuddee eastward of Seoreenarrain; then reappearing on the opposite side of the Mahanuddee, they continue close to the eastern branch of that river till they connect themselves with that great southern range from which the Mahanuddee takes its rise, and which divides it from the Bustar State. The "great plateau of Chutteesgurh,"† comprising the districts of Belaspore and Raepore, with their dependencies, is bounded on the north and east as above described. On the west it is flanked by the ridge commencing at Ummerkuntuk, and ending at the point known as the Salee Tekree Hills; from which point, again, low detached spurs skirt the western frontier, till they become blended in the Mahanuddee range. None of these ranges or isolated blocks of hills attain any considerable altitude. The highest peaks above sea level are in Sahawah, *viz.*, Bihoa Hill 2,084 feet, Maharnee 2,091 feet, Tohar 2,017 feet, and Jogi, south of Sahawah, 2,389 feet. The slope of the ranges generally is on the west gradual, but on the east abrupt and steep. The low spurs skirting the western boundary of Chutteesgurh are, to a large extent, of trap formation, while those to the east and south belong to the metamorphic series, being composed generally of gneiss and quartz crossed occasionally by sandstone rocks. The total area of this tract, including hill,

Of the total area of Chutteesgurh 14,000 square miles are in British territory, and 8,000 in the eight Feudatory States attached to it.

places there is a thick deposit of pale brownish coloured alluvium.

Minerals.

Coal of inferior quality is found in several places, and there are some well-known iron mines worked after the native method. The limestone of the hills at Bheraghat is popularly known as the "Marble Rocks."

Products.

The forest products are those common to other districts, and so are the agricultural, the principal crop being wheat.

† *Soils.*

The tract between the Sheo-

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated—in British or Native territory.	Prevailing soils, minerals, and products.
Mountains and elevated tracts—continued.	forest, and plain, may amount to 22,000 square miles, and may be separated into the following distinctive tracts: (1) the valley of the Sheonath, and the tract between that river and the Salee Tekree Hills; (2) the tract between the Sheonath and Husdoo Rivers; (3) the tract between the Sheonath and the Mahanuddee; and (4) the tract south of Raepore extending downwards towards the Mahanuddee.		nath and Husdoo has a darkish clayey soil, producing abundant harvests of rice, wheat, and pulses. Between the Sheonath and Mahanuddee the soil is reddish; south of Raepore it is similar to that last mentioned.

In the Sumbulpore plain—which may be called the valley of the Mahanuddee—the most noticeable hill range is what is known as the Barapahar, covering an area of some 100 square miles, and bordering the Mahanuddee to the south of Pudumpore. The formation is trap, and the highest point about 2,200 feet above the level of the plain. The Jhurgathee range extends from the Ebe River to the Zemindaree of Lehra, some 15 miles. The Bodapoli range runs for some 23 miles along the left bank of the Mahanuddee between the Khalsa and the State of Rehracole; connected with it is a range running east and west on the immediate borders of Rehracole. In Pudumpore the Jargaon range runs from east to north-west for 10 miles. Among the most noted hills in the Gurjat States is a large range in Phooljhur connected on the north side with the Barapahar range. Another vast range divides Phooljhur and Borasambar from Patna. On the east of Kharonde is a range which runs nearly the whole distance of that State from north to south, and is said to be 2,500 feet above the level of the plain. These tracts are not yet surveyed. The valley of the Mahanuddee proper is of ever varying dimensions, in places opening out into extensive cultivated plains, and anon contracted to the river's bank by the encroachment of hills. The tracts directly administered by the Government, which are surrounded by a circle of Zemindaree estates, sixteen in number, have an area estimated at 4,200 square miles, and these again are encircled by Gurjat States, whose area is computed at 7,000 square miles, thus making the total area of the Sumbulpore tract 11,200 square miles.

Minerals.

Belaspore. Iron ore plentiful and readily worked. The Vyndias supposed to have coal in some quantity as it is exposed in the Husdoo and neighbourhood. In Raepore iron ore is principally

Next in order to be described is the Bustar Dependency,* forming the extreme south-eastern portion of the Central Provinces. The eastern portion of the State is an elevated plateau about 2,000 feet above the level of the sea, while the western and southern portions are below 1,000 feet. The plateau extends on the south to the Tangree Dongree and Toolsee Dongree Hills, on the west as far as the hills between Nagatoka and Barsoor, on the north to where the Mahanuddee and Sew Rivers have their rise, and to the east it extends beyond the boundary of Jeypore as far as the Eastern ghats. The total area of the entire tract is computed at 13,062 square miles.

The whole in Native territory.

Immediately on the west of this State, along the left bank of the Godavery River, lies the British district of "Upper Godavery," comprising six talooks, with an area about 1,926 square miles. These talooks may be said to form a strip of level country lying between the Godavery and a range of hills which separate them from the Bustar Dependency. This range runs from north-west to south-east parallel to the course of the rivers. The formation is "metamorphic, and consists chiefly of vitrified sandstone, which in some places has been rendered only partially crystalline by the action of volcanic heat, while in other places the same agency has caused them to lose all trace of their original character." At Enchampilly the hills come close to the Godavery River, and for a short distance cross it, forming what is known as the 2nd Barrier in the Godavery Navigation Works.

Wholly in British territory.

The detached hill ranges in the Chanda District are the Panabaras, Ambagurh Chowky, Kotegul, and Rangee ranges, and the Perzagurh, Chimoor, Mhool, Soorjagurh, and Dewulmurree Hills. In the Wurdah District a low range of hills lies on its northern frontier, rising in places to a height, at Mallagaon, of 1,726 feet, Nandgaon 1,874 feet, and Gurramsoor 2,186 feet. In the Nagpore District a low range runs along the north-western frontier, averaging about 12 miles broad, including the Tekaree Hill, 1,668 feet; on the south of this range lies the sacred hill of Ramtek (1,400 feet). Another range runs along the western and southern frontier, including the hill of Kurkee, rising 2,000 feet, the highest elevation in the district. A third range bisects the Katole Tehseel, forming a connecting link between the two hill divisions just described. In the

Wholly in British territory.

worked in Lohara and Parsuda on the Jonk.

Products.

The forest products are similar to those stated for Mundla,—lac and the silk cocoon being largely gathered for export. The agricultural resources of the tract are immense, so much so that Chutteesgurh is popularly styled the granary of the Nagpore and Berar country.

**Soil.*

Light clay with an admixture of sand suited for rice and wet crops. The proportion of black cotton soil is small.

Iron ore is found and worked in several places, especi-

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated—in British or Native territory.	Prevailing soils, minerals, and products.
Mountains and elevated tracts—continued.	Bhundara District the Salee Tekree or Lanjee Hills, the most southern outwork of the great Sautpoor chain, stand on its northern frontier. There are other ridges and clusters of hills in various parts of the district, such as the Ambaghur, the Bullahi, the Nowagoan. But as the tracts comprised within the four districts here mentioned form the valleys of the Wurdah and Wyngunga, they will be found more properly described as the great plain of Nagpore under its appropriate heading next following.		ally near the Baila Deela Hills, and in the valley of the Joreewag River. Gold is found in small quantities in the Kotree River
	by a class of people called Sonjurees. The forest products are similar to those elsewhere described, and the principal agricultural products are rice and sugarcane.		
Plains.	The valley of the Wurdah comprises the districts of Nagpore and Wurdah, south of or below the Sautpoora range of hills. On the west it is bounded by the river Wurdah, which separates it from Berar and the Nizam's dominions. The flat unvarying champaign of unbroken cultivation contrasts strangely with the stony, jungly, rugged, and undulating tracts around it. Demarcated by the low hill ranges already described, the plain tracts in the Nagpore District lie, first, in the western half of the Katole sub-division, and contains the most highly cultivated land in the district, with an area of about 300 square miles sloping towards the Wurdah River on the west; secondly, the tract lying between the Sautpooras on the north, to the confines of Bhundara and Chanda on the east and south-east, in extent about 2,000 square miles, with a general slope towards the Wyngunga on the south-east; and thirdly, a strip of rich cultivated country, lying between the hills on the south and the borders of the district, of from 4 to 10 miles in breadth, and in length from south-east to north-west about 24 miles. It is along the left bank of the Wurdah River that there is situated the great "Cotton field" of the Central Provinces. In the	Situated entirely in British territory.	*Soil.* Mainly black cotton soil. The forest products are similar to those described for the hill districts of the Sautpooras, and may be said to be gathered in larger amount in the Bhundara and Chanda Districts than in the Nagpore and Wurdah.

north, where the river debouches from the Sautpooras, the cotton cultivation consists of a rich but narrow strip along the bank. This strip widens as it proceeds southward into the Wurdah District, till, owing to a semi-circular curve of the river, it attains a width of 50 miles at a point which may be marked by Hingunghat, the well-known cotton mart. Here the plain is of black loamy soil cultivated partly with cotton, and partly with wheat and maize. Then the plain gradually becomes narrower and narrower, still hugging the banks of the river, but more and more encroached upon by the brushwood and forest, till it becomes lost a little below the old city of Chanda. At this point the desert and the garden are brought into juxtaposition: on one side of the city there is the black loam and the cotton crops; on the other side, there is the barren and unpropitious ground covered with low forest and brushwood, and tenanted by wild beasts. This black soil tract cannot be less than 100 miles in length, with a varying breadth covering an area altogether of about 2,000 square miles.

The valley of the Wyngunga, where the river debouches from the Sautpoora Hills, is broad, generally cultivated, and often rich. On the right bank, opposite the capital of Nagpore, the valley reaches out to a great breadth, till it is separated by some hilly country from the valley of the Wurdah. This has been called the great "Plain of Nagpore." On the opposite side of the river the country is more broken or undulating, and but partially cultivated, chiefly by means of irrigation from tanks. Further south, the valley in the Chanda District becomes narrower, but continues rich, abounding in rice cultivation and highly irrigated, until at last it joins the Wurdah below Chanda. The feeders of the Wyngunga have valleys of a similar character, in many places opening out into broad bays studded with villages and well cultivated. As the valley of the Wurdah is the cotton field, so the lower valley of the Wyngunga is the rice field of the Central Provinces.

Taking the two valleys together the great plain of the Nagpore country may be stated to be 21,675 square miles in extent, of which above one-fourth is under cultivation.

* The next great plain tract to be described is the valley of the Nerbudda. This may be said to commence from the western limit of the Hoshungabad District (not far from Mhow and Indore), passing through the Nursingpore District on to Jubbulpore. It is bounded on the north by the Vindhyas, and reaches to the Sautpooras, which form its southern boundary. At Jubbulpore it is gradually cut off by the off-shoots

In British territory.

In the Chanda District coal has been found in several places, and promises to become an important addition to the wealth of the country. Agricultural produce principally consists of cotton, rice, wheat, maize, and pulses, opium, and tobacco. In the Nagpore District the cultivation of the orange (sangtra) and the betel-leaf, and in the Bhundara District the sugar-cane, are worthy of mention.

* Black cotton soil prevails throughout the valley proper, but above Jubbulpore red soil is of more frequent occurrence.

Nature of the different tracts.	Name, area, and physical description of each tract.	Where situated—in British or Native territory.	Prevailing soils, minerals, and products.
Plains—continued.	of the Sautpoora Hills. It is on the whole broad, often having a breadth of 30 miles. Its extreme length may be more than 200 miles, watered by the Nerbudda from end to end. For the most part it is a sheet of excellent cultivation of wheat, sugarcane, and cotton, and is one of the finest parts of the Central Provinces. From Jubbulpore northwards towards Mirzapore there is a tract which is really a branch of the Nerbudda Valley, though it is not permeated by any stream of note. It is about a hundred miles in length and of varying breadth. In fertility it is hardly inferior to the Nerbudda Valley. Inclusive of this tract the Nerbudda Valley may be said to be 12,453 square miles in extent.		Forests products, the same as already described. Wheat is the staple crop, but all the other agricultural products are raised. The cotton is inferior. The best sugarcane in the Central Provinces is raised in the Jubbulpore District, and the best wheat in Hoshungabad.
	Under the category of "plains" may be ranked the districts of Saugor and Dumoh,* an undulating country bordered on the north by the southern face of the Vindhya table-land. Though often either rugged, or arid, or overgrown with jungle, it has much scattered cultivation, and contains many spots of richness and beauty. The total area of this tract is 6,400 square miles, of which 999,976 acres are under cultivation.	Wholly in British territory.	
	The last tract to be mentioned is the district of Nimar,† on the westernmost frontiers of the Central Provinces. The northern portion of the tract may be roughly described as a continuation of the long valley between the Nerbudda River and the Sautpooras. Towards the river, though rich in parts, and occasionally bearing marks of perished wealth and greatness, this tract is still desolate and wild. Nearer the base of the hill range, the country forms itself into a large natural basin of fertile land highly cultivated. South of this again, the Sautpooras run from east to west pierced by the Taptee River, which, as it were, rends them in twain, opening out at first narrow, and then broader valleys, until, near the city of Boorhanpore, there is a fine open tract between the divided ranges. On the northern section of the range near Khundwah is the fortress of Asseerghur, commanding one of the main lines of		Very promising iron and coal mines are being worked by a European firm under license in the Nursingpore District; the form-

communication through the Peninsula. South of Boorhanpore the valley of the Taptee, some 20 miles broad, is bounded by the hills which form the southern section of the range. These hills gradually slope down towards the Poornah River, which separates Nimar from Berar and from Khandesh. No accurate survey has yet been made, but the district may be estimated in round numbers at 2,700 square miles, of which about one-fifth is cultivated.

er at Tendhookheera, and the latter at Burkoe.

* The rich black soils predominate in the open valleys.
Forest products, as before.
In mineral products the tract is comparatively poor. Iron is found, but is considered of inferior quality. Very good building stone and slate are found. The staple crop is wheat.

† *Soil.*—Black soil predominates in the plains. A lighter and poorer soil on the higher levels.
Minerals.—Iron ore of good quality in abundance.
Forest Products.—The same as elsewhere.
Agricultural.— Ditto.

APPENDIX G.

Rules for the sale of Unassessed Waste Lands in the Central Provinces (published in Notification of the Government of India, Foreign Department, No. 158, *dated 7th July* 1863).

Rule I.—All unassessed Waste Lands in which no right of proprietorship or exclusive occupancy is known to exist, or to have existed and to be capable of revival, are available for purchase under these rules, unless specially reserved under Rule XIX.

Rule II.—The maximum limits of the quantity of land which will for the present be sold in one lot in the several districts of the Central Provinces will be as mentioned below :—

1. Raepore	District	}	5,000 acres.
2. Belaspore	,, ...		
3. Mundla	,, ...		
4. Sumbulpore	,, ...		
5. Upper Godavery	,, ...		
6. Hoshungabad	,, ...		
7. Nagpore	,, ...	}	3,000 ,,
8. Chanda	,, ...		
9. Bhundara	,, ...		
10. Wurdah	,, ...		
11. Jubbulpore	,, ...		
12. Nursingpore	,, ...		
13. Chindwarra	,, ...		
14. Seonee	,, ...		
15. Saugor	,, ...		
16. Baitool	,, ...		
17. Dumoh	,, ...		

If, for special reasons, in particular localities, lower maximum areas should be determined upon, due notice will be given.

SUPPLEMENT.—*There is no prohibition against the same person applying for two or more lots of land, provided that each application comprises no more than the maximum of acres prescribed for the district or locality in which the said lots are situate.*

* *Rule III.*—Every lot shall be compact, and shall include no more than one tract of land in a ring-fence. No lot will be sold unless previously surveyed and demarcated. The survey need only be in sufficient detail to ensure the ready identification of the boundaries of the lot and to ascertain its gross area. If, on completion of the survey, it shall appear that the area of the lot applied for exceeds the prescribed maximum, the excess shall be excluded.

SUPPLEMENT.—*If it should appear from the survey or otherwise that the application does not comply with these conditions, the Deputy Commissioner may call for an amended application; and in the event of a revised application not being given in within fifteen days, the application shall be held to be cancelled, and the deposit made under Rule VI. and its supplement shall be returned to the applicant, less the amount of expense actually incurred for advertisement, survey, and the like.*

Rule IV.—Applications for the purchase of Waste Land shall be made to the Deputy Commissioner of the district, and every application shall contain the following particulars:—

1*st.*—The estimated area of the land applied for.

2*nd.*—The situation of the land and its boundaries, as accurately as can be ascertained.

Rule V.—If the Deputy Commissioner is able to satisfy himself that the land applied for is available for purchase under Rule I., and within the conditions prescribed in Rules II. and III., and if the land shall have been previously surveyed and demarcated, he shall advertise the lot for sale on a given day at an upset price as hereinafter specified. The advertisement shall be published in both the English language and the vernacular of the district in the Deputy Commissioner's office, in the offices of the Tehseeldars of the district, and in the police station within the limits of which the land may be situated.

SUPPLEMENT.—*An advertisement shall also be published in the* CENTRAL PROVINCES' GAZETTE. *The form of advertisement will be hereafter prescribed.*†

---

* Registers, with topographical description and map, of all Waste Land plots available for sale or lease in each district, are open for public inspection at the offices of Deputy Commissioners, and published for general information in the *Central Provinces' Gazette.*

† Form subsequently prescribed in Chief Commissioner's Office Circular XL., dated 5th October 1863, and hereto appended, marked A.

Rule VI.—If the Deputy Commissioner be satisfied as above, and if the land have not been surveyed, he shall cause it to be surveyed and its boundaries demarcated, the estimated cost of such survey and demarcation being first deposited by the applicant. On the completion of the survey, the advertisement of sale shall be published as above.

SUPPLEMENT.—*The sum to be deposited will include the estimated cost of clearing the boundaries for survey; but it is not, under any circumstances, to exceed* 4 *annas an acre.*

Rule VII.—The day of sale to be named in the advertisement shall not be less than thirty days from the date of publication of the advertisement of sale in the office of the Deputy Commissioner. The sale shall be held at the Deputy Commissioner's office. The sale may be postponed if, in the Deputy Commissioner's judgment, it be necessary, due notice being always given of the date on which the sale will be held.

Rule VIII.—If, before the day of sale, no claim of proprietary or occupative right in the land be preferred, the lot shall be sold by auction to the highest bidder above the upset price, or to the applicant at the upset price, if there be no higher bid.

SUPPLEMENT.—*If the Deputy Commissioner think it necessary, he may refuse to recognise any bid which is not supported by the deposit of the amount required by Rule XVII. Immediately as sale is made, it shall be entered in a register in a form to be hereafter prescribed.**

Rule IX.—The upset price of the lands to be sold will ordinarily be as follows; but in special cases, the Deputy Commissioner, with the sanction of the Commissioner, may put a higher upset price on any lot, provided that in no case shall the upset price exceed four times the ordinary rates:—

(1)—In the Raepore, Belaspore, and Mundla Districts, 8 annas per acre;

(2)—In the Sumbulpore and Upper Godavery Districts, 1 Rupee per acre;

(3)—In the Hoshungabad, Nagpore, Chanda, Bhundara, Wurdah, Jubbulpore, Nursingpore, Chindwarra, Seonee, Saugor, Baitool, and Dumoh Districts, Rs. 2-8-0 per acre.

---

* Form prescribed in Chief Commissioner's Office Circular XL., dated 5th October 1863, and hereto appended, marked B.

The upset price will be calculated on the whole area of the lot without any deduction on any account whatever.

SUPPLEMENT.—*In considering the upset price to be fixed in special cases, Deputy Commissioners will not overlook the value of the trees on the land applied for.*

Rule X.—On the payment of one-tenth of the purchase-money, and of all expenses of survey, demarcation, advertisement, and sale, the purchaser shall receive a deed* (in a form which will hereafter be issued by the Chief Commissioner), signed by the Deputy Commissioner, conveying to him the lot in full hereditary and transferable proprietary right free for ever from all demand on account of land revenue, but subject, nevertheless, to all general taxes and local rates imposed by law or by the Local Government, and to any other claim, whether of the Government or otherwise, that may have been or may hereafter be established in any Court of competent jurisdiction.

Rule XI.—If, before the day of sale, a claim of proprietary or occupative right in any part of the land be preferred, the Deputy Commissioner shall investigate the claim, and if satisfied that it is groundless, shall reject it and proceed with the sale.

Rule XII.—If on investigation any such claim should appear to be well-grounded, the Deputy Commissioner may either reject the application for purchase of the lands, or refer it for the orders of the Commissioner. In the former case, the applicant may appeal to the Commissioner.

Rule XIII.—The Commissioner may direct the Deputy Commissioner either to reject the application, or to proceed with the sale of the land, either unreservedly, or on the conditions prescribed in Rule X.; or, if any claim to right of proprietorship, occupancy, or use in any part of the lands be established to the satisfaction of the Commissioner, with a special reservation of such right, or exclusive of the area in which such right exists. If the application for purchase of the land be rejected, the amount deposited as cost of survey, after deduction of any expenses which may have been incurred in survey, demarcation, advertisement, or any other way incident to the transaction, will be forfeited or refunded, as the Deputy Commissioner may direct, according to the circumstances of the case.

---

* Forms of deed prescribed in Chief Commissioner's Circular XIII., dated 27th April 1864, and hereto appended, marked C and D respectively.

Rule XIV.—On being put in possession of the lot, the purchaser shall be bound to erect as many substantial boundary marks of masonry as the Deputy Commissioner may think necessary, provided it be not made incumbent on the purchaser to erect more than at the rate of four marks per mile of boundary line.

Rule XV.—If the land be purchased by any other person other than the applicant, the estimated cost of the survey deposited by the applicant under Rule VI. shall be returned to him, and the actual cost of survey and demarcation shall be charged against the purchaser in addition to the price of the land.

Rule XVI.—The purchaser may, if he choose, pay the whole of the purchase-money when the lot is sold, or the deed delivered to him. Or, if he choose, he may pay a portion, not being less than 10 per cent., at the time of sale, and the remainder in instalments at any future time, not being more than ten years from the date of sale. In the latter case, simple interest at the rate of 10 per cent. a year will be charged on the unpaid portion of the purchase-money, and the whole lot will remain hypothecated as security for the full discharge of the amount, including principal and interest, and be liable to sale by order of the Deputy Commissioner if the said amount of either principal or interest be not paid within the stipulated period. Should such sale take place, the defaulter will have no claim for improvements against the Government, or on any other account, except for the one-tenth of the purchase-money paid, and for that, only in the event of the amount realised at the second sale at least equalling the amount of the original sale, plus any interest due to Government by the original purchaser on the unpaid portion of the purchase-money.

SUPPLEMENT.—*The interest due for any year, or part of a year, under this rule shall be payable on or before the 15th of May, and if the amount be not paid on that date, the Deputy Commissioner may realise the amount by sale of the lot under the rules in force at the time being for the sale of estates on account of arrears of revenue due from other estates. Any balance of the purchase-money which may not have been paid up before the 15th of May of the tenth year following that of the sale may be realised in the same manner as an arrear of interest outstanding on that date. The proceeds of the sale shall be applied, in the first instance, to the payment of the costs of sale and to the satisfaction of the demand of Government; the surplus shall be payable to the late registered proprietor or proprietors on their joint receipt.*

Rule XVII.—If the purchaser fails to pay one-tenth of the purchase-money and all other expenses within three months from the day of sale, the lot will be put up to sale again on the same conditions as before, and sold at the risk of the first purchaser, whose deposit will also be forfeited.

Rule XVIII.—No sale of Waste Lands once made by a Deputy Commissioner in conformity with these rules will be disturbed by any higher executive authority, but all such sales shall be immediately reported to the Supreme Government.

Rule XIX.—Reserves of grazing and forest land, of land for the growth of firewood near towns and stations, of building sites, parks, recreation-grounds, of tracts possessing mineral wealth, stone quarries, and the like, and of land required for other special purposes, are not to be sold under these rules without the express sanction of the Chief Commissioner. A list of these lands is under preparation, and will be published hereafter in the *Gazette of India*.

Rule XX.—Lands for the purchase of which application has been made under the Resolution of the 17th October 1861, will, if such applications were duly registered, be dealt with in accordance with the terms of the said resolution so far as the law allows.

Rule XXI.—From and after the date of the promulgation of these rules, no fresh applications for grants of Waste Lands under any previous rules will be entertained.

Rule XXII.—The rules relating to the disposal of claims to land, for the purchase of which application may be made, will be subject to the provisions of any law which may hereafter be passed for regulating the disposal of such claims.

Rule XXIII.—The above rules will continue in force for two years from the first January 1863.*

Supplementary Rule XXIV.—If it should at any time be found that the same land has been included in more than one lot, it shall be held to belong to the lot first sold, and all subsequent sales shall, as regards such land, be null and void. In the event of any dispute regarding the boundary of two or more adjoining lots, the Deputy Commissioner may, on the application of any one of the parties, readjust the boundaries of the lots, and his decision will be final. The

* Subsequently extended by notification of the Government of India in the Foreign Department.

price paid by any subsequent purchaser for land thus excluded from his lot will be refunded to him with simple interest at (10) ten per cent. The sum to be refunded will be calculated on the average price paid per acre, excluding the cost of survey and advertisement.

A.

Form of Advertisement referred to in the Supplement to Rule V. of the Rules for the Sale of Waste Lands in the Central Provinces.

NOTICE.

Sale of Waste Lands.

*District*_____.

Notice is hereby given, that the undermentioned lots of Government Waste Lands, which have been applied for under the Notification by the Government of India, in the Foreign Department, No. 158, dated 7th July 1863, will be put up to auction sale at the upset price of an acre, and sold to the highest bidder, on the day of 186 , at the Office of the Deputy Commissioner of , should no such objection be preferred as to render it necessary to defer the sale under the provisions of Act XXIII. of 1863. The sale will be made in the manner and subject to the conditions prescribed by the Government Notification, and by the Act above cited:—

Estimated area.	Situation.	Boundaries.

Dated_____.

Deputy Commissioner.

B.

Form of Register referred to in the Supplement to Rule VIII. of the Rules for the Sale of Waste Lands in the Central Provinces.

District.	Serial No.	Date of Sale.	Estimated area.	Situation.	Boundaries.	Purchaser's name.	Price.	REMARKS.

Form of Deed of Sale prescribed in Rule X. of the Central Provinces' Waste Land Sale Rules, dated 7th July 1863.

C.

For sale of Waste Lands, where the consideration is paid in full at the time.

The Secretary of State for India in Council, in consideration of the sum of Rupees paid by into the hands of the of (as appears by the receipt herein endorsed) doth, in virtue of all powers and authorities enabling him in that behalf, and so far as he lawfully can, or may, by these presents, grant and convey unto and his heirs all that lot, No. , of unassessed Waste Land, comprising acres, situate and being at in the district of , in the Central Provinces, and bounded

A counterpart of this to be executed by the purchaser on paper bearing a stamp of the value of 1 Rupee, under Clause 36 of Schedule A annexed to Act X. of 1862.

as the same has been surveyed and demarcated, together with all rights of forest, pasturage, mines, fisheries, and all other the proprietary-right and interest of the said Secretary of State in Council in and over the soil of the said lands hereinbefore mentioned (except as hereinafter excepted).* *To have and to hold* the said lands and premises hereby granted unto, and to the use of the said , his heirs, representatives, and assigns, for ever free from all present or future demand on account of Government land revenue, but subject † [to the right of to occupy the said lands (or "to occupy acres of land") situate within the limits of the said grant as delineated in the map or plan, drawn in the margin hereof, for the term of at the rent of (or "rent-free") and also subject] to all general taxes and local rates, now or hereafter to be imposed by law in respect thereof, and to all claims of the Govern-

* Where a right of proprietorship is established, the lands surveyed must be marked out exclusive of such area, but where any limited right short of that of proprietorship is reserved, it must be distinctly described in this place.

† Where no limited rights whatever are reserved, the words within brackets are to be omitted altogether.

ment of India, in respect of such land other than claims of Government land revenue. *Except and always reserved* to the said Secretary of State in Council, his successors and assigns, out of the grant hereby made, a strip of land, at least twenty feet in width, along each bank of every navigable river or stream (if any) which now, or at any time hereafter, shall flow within the limits of the said grant: and *except and reserved also* to the said Secretary of State in Council, his successors and assigns, and to all other persons, the right of freely using any such river or stream for purposes of navigation or irrigation, or the transport of timber or other property, or other purposes of general utility; and the said , for himself and his heirs, representatives and assigns, hereby covenant with the said Secretary of State in Council, his successors and assigns, that he, the said , will, within months after being put in possession of the said lands, erect, at his own expense, such and so many substantial boundary marks of masonry on the lands hereby granted, as, by the Deputy Commissioner of the district for the time being, shall be required to be erected, provided it be not made incumbent on the said to erect more than at the rate of four marks per mile of boundary line; and further that, in the event of any dispute arising regarding the boundaries of the lands hereby granted, and any adjoining lands heretofore or hereafter to be granted or sold by the said Secretary of State in Council, it shall be lawful for the Deputy Commissioner or other Officer exercising revenue powers in the district for the time being, to enter on the lands hereby granted, and re-adjust the boundaries of the same and the adjoining lands aforesaid, and that the decision of the Deputy Commissioner in such cases shall be final and binding on the said , his heirs, representatives, and assigns. In witness whereof, , at present Deputy Commissioner of the district of , by order and under authority of His Excellency The Vice-Roy and Governor General in Council (acting through the Chief Commissioner of the Central Provinces in the premises for and on behalf of the said Secretary of State in Council), and the said have hereunto set their respective hands and seals this day of one thousand eight hundred and sixty .

Signed, sealed, and delivered.

D.

To be endorsed on both parts of C, in cases where the land has been surveyed before grant, and where the whole purchase-money is not paid at the time of sale, but is secured as provided by Rule XVI.

WHEREAS, on the sale of the within-mentioned Waste Lands, *one-tenth** only of the purchase-money within mentioned was paid by the within-named , and it was agreed that the residue thereof should be paid by such instalments, with interest, as are hereinafter mentioned, such payments to be secured to the Secretary of State in Council, as hereinafter provided. *Now these presents* witness that, in consideration of the premises, the said , for himself, his heirs, representatives, and assigns, doth grant and confirm unto the said Secretary of State in Council the within-mentioned lands, with the appurtenances and all benefit and advantage thereto belonging, to hold the same unto the said Secretary of State in Council, his successors and assigns, by way of security, for the sum of Rupees , being the residue of the said purchase-money; and the said , for himself, his heirs, executors, administrators, and representatives, doth hereby covenant with the said Secretary of State in Council, his successors and assigns, to pay the said residue, or sum of Rupees , into the treasury of the of in instalments such that the entire amount of the said residue, or Rupees , shall be so paid on or before the 15*th day of May* 18† , and also on or before the 15th day of May in each year, to pay into the said treasury, interest at the rate of ten per cent. per annum on the balance of the principal sum up to that time remaining due. Provided that if default shall be made in payment of the interest falling due, as aforesaid, at the time and in manner hereinbefore appointed, the balance of the whole purchase-money of the said land, together with the interest then remaining unpaid, shall at once become due and payable; and on any sum becoming so due, or for the realization of any sum remaining due on the 15*th day of May* 18 aforesaid, it shall be lawful for the said Secretary of State in Council, his successors or assigns, acting through the Deputy Commissioner of the district in which the said land is situate, or other authorized Officer, forthwith and without further consent of, or notice to the said , his heirs, represent-

* As the case may be.

† Here enter the tenth year from the data of sale.

atives, or assigns, to sell the within-mentioned land, or any part thereof, by public auction, in one or more lots, with full power to buy in the said premises, or any part thereof, at any such sale, and to re-sell the same without being responsible for loss thereby, and, for the purposes aforesaid, to make and execute all necessary deeds and instruments of sale and otherwise: and no purchaser at any such sale shall be bound to see or inquire whether default in payment has been made by the said , or whether any money remains due on this security; and the receipt in writing of the said Deputy Commissioner, or other authorized Officer for the purchase-money of the premises sold, shall be a good discharge to the purchaser; and it is hereby agreed that the said Secretary of State in Council, his successors or assigns, shall hold the moneys to arise from any such sale as aforesaid, upon trust, in the first place, to pay all expenses in anywise incident to such sale or sales, or the exercise of the aforesaid power; and, in the next place, to apply such moneys in or towards satisfaction of what may, for the time being, be due upon the security of the sepresents; and then, in trust, to pay the surplus (if any) to the said , his heirs, representatives, or assigns. In witness whereof, the said has hereunto set his hand and seal, this day of one thousand eight hundred and sixty .

Signed, sealed, and delivered

N.B.—This endorsement on the part of deed C, which is signed by the Deputy Commissioner, must bear the same stamp as a deed of mortgage securing the same amount would require.

APPENDIX H.

Specimen of the information available regarding Waste Lands in the several Districts of the Central Provinces.

WASTE LANDS IN THE CHINDWARRA DISTRICT.

[Similar information is available for all the Districts in which the Settlement has been made. A précis of the information will be contained in my next Report].

PREFATORY NOTE FOR THE WASTE LAND REGISTER, CHINDWARRA DISTRICT.

I.—EXTENT OF WASTE LANDS. The greater portion of the Chindwarra District known formerly, whilst it formed an integral part of the Nagpore Native Territory, as Deogurh above the Ghats, is a block of the Sautpoora range: that to the south of these hills is a narrow strip of highly cultivated country, situated between them and the Nagpore District, the whole covering an area of about 1,871,417 acres, out of which 1,384,186 acres have been conferred in proprietary-right upon landholders; a small portion, *i. e.* 109,933 acres, has been reserved from sale by the Forest Department, and all the remainder, 377,298 acres, will be available either for sale under the Waste Land Rules, or for grant under the clearance regulations, or the farm of the forest produce may be purchased by the highest bidder, year by year. These Forest Waste Lands are strictly unreserved, and are divided into 442 lots; each lot, whatever its size, is separately entered in the District Register, and there is a separate map prepared for it. The register and the maps are in the Zillah Office, and are freely open to the public without fee on application.

II.—ELEVATION. The land thus available under the rules is for the most part at an elevation ranging from about 1,100 to 2,500 feet above the sea level, the highest land being situated on the extreme west and north of the district, bordering on the Baitool District and the estates of the Jageerdars; the lowest land, on the other hand, being below the ghats adjacent to the Nagpore District. In this register, although the heights are given, they must be understood to be merely approximately calculated, and the aggregate acreage of the lots is not quite correct, as many of the areas of villages declared wholly waste have not been accurately tested by the Settlement Department, but only roughly estimated.

III.—Topography. For the most part all the lots consist largely of lands which have hitherto been considered by the natives as presenting too many physical obstacles to cultivation to attempt it, being either in dense jungle, or hilly, or situated between hills, or having but poor soil; but in many lots, especially to the westward, are tracts comparatively level and well adapted for cultivation when cleared of jungle, and capable of producing remunerative crops of various kinds. The present obstacles in the way of cultivation of these extensive tracts are chiefly the paucity of its inhabitants, the want of cart roads, and the complete absence of any suitable market in the neighbourhood for the produce when industry shall yield its fruits; but the opening of the Hoshungabad railway will, however, remove some of these difficulties, and will give an impetus to local industry.

IV.—Natural Products. Most of the lots are wholly of jungle. The Forest Department has already taken under its management the best wooded portions, and formed them into a reserve, but there still remain tracts sufficiently provided with timber in the Assair, Omrait, Kumharpanee, and Mokhair Pergunnahs, although not to such an extent as to render it necessary to reserve them as Government forests. The most valuable tracts, as far as timber is concerned, are those situated on the banks of the Kanhan and the Pench, where there is also river communication to convey forest and agricultural produce to the markets of Kamptee and Nagpore. The following lots possess a certain quantity of young teak :—

5, 18, 25, 26, 36, 45, 47, 58, 59, 60, 63, 64, 66, 73, 76, 77, 80, 99, 107, 118, 126, 137, 145, 147, 150, 175, 180, 207, 208, 215, 221, 224, 226, 228, 229, 230, 233, 234, 237, 238, 245, 246, 249, 266, 283, 289, 291, 292, 293, 294, 296, 301, 343, 346, 351, 380, 382, 390, 392, 403, which could with care and attention be considerably increased. In the Kumharpanee and Assair Pergunnahs there are remunerative mohwa crops.

V.—Soils and Cultivation. In the Settlement Department the soils of the district have been classified as elsewhere in the Central Provinces, and are known as first-class black cotton, locally called Kalee, second-class Khurdee, and third-class Retaree. The produce of Chindwarra is not dissimilar to that of other districts; but sugarcane, opium, and other first-class crops are readily produced in this district upon soils which are elsewhere considered to be wholly unsuitable for such cultivation. As a rule, Chowrye Pergunnah yields gram and wheat, but no jowaree; Mokhair, the several kinds of pulses, wheat, a

small quantity of opium and sugarcane, with some jowaree. Kumharpanee is exclusively devoted to the cultivation of wheat and pulses. Mohgaon and Pandoorna, cotton, toor, and jowaree, and a little sugarcane and opium. Oomrait, sugarcane; and along the Pench Valley wheat and gram, opium and oil-seeds. Assair, the inferior crops of grain cultivated by Gonds and other hill tribes, with an inconsiderable quantity of wheat and some opium. Chindwarra and Ambawarah, on the other hand, produce some of all kinds of crops, and the cultivation of these two pergunnahs is not so distinctive in its character as in the other parts of the district. The cotton produced in the Mohgaon Tehseelee is, as a rule, grown for the market, and is cultivated with considerable attention and industry, and the staple is of good quality in consequence; whilst that produced in other parts of the district is much inferior, and is grown chiefly for home consumption—that produced in the north of the district is decidedly bad, the fibre being short, crisp, and deficient in strength, and the plants generally have a stunted appearance.

In a general point of view, the district may be considered to be excellently watered, as in few parts of it is it necessary to sink wells beyond thirty feet deep; and in several pergunnahs—notably in Oomrait and Assair—less than half that depth suffices to secure an ample supply of water for cultivation purposes.

VI.—Communications. The great bulk of the waste land lots are situate above the ghats, and the distance to the nearest railway, that of Nagpore, is about 80 or 90 miles, excepting those lots in Assair, where, of course, the distance must be considerably greater; but the Hoshungabad railway will, for these localities, be more easily accessible, and roads in that direction will no doubt engage early attention. The road to Nagpore is an Imperial line, and may be expected to be in a good condition before long, but at present all that can be said of it is that it is merely a fair-weather road: indeed, that is quite as much as can be safely said of the district roads generally; there are no made-roads, but mere surface repairs to the country tracks after each monsoon place them in a fair condition for all practical purposes, and carts are habitually used as a means of transporting grain and other articles exported, excepting in Assair and the Jageerdarees, where the chief means of transport is by pack bullocks.

VII.—Market Towns. The chief towns of the district, where a ready sale may be effected of all agricultural produce, are at Chindwarra the Sudder Station, Pandoorna, and Lodheekhera to the south, and

bordering on the Nagpore District, where also the towns of Nurkhair, Saonair, Mowar, and Kelode, are sufficiently near to the Mohgaon Tehseelee to be available as places where all kinds of produce may be disposed of.

VIII.—Population. The inhabitants of the localities wherein waste land is available are very limited in number, and are chiefly Gonds and Gowlees.

IX.—Present Value. The annual usufruct rental of the waste land produce is at present about Rs. 12,844, and it would exceed that sum were it feasible to transport the forest produce to a suitable market without excessive cost; but no doubt in time these tracts will become much more valuable property, for, as cultivation of village lands increases, so will the demand for wood, grass, &c. from these wastes likewise increase. The Chowrye Pergunnah, for instance, has little or no jungle, and the people cannot buy grass and wood, except from a distance. In other localities, also, the villages will tend to encroach on the waste lands. These circumstances will sensibly affect the value of the waste lands.

The climate of the district generally is good and moderate, and nowhere, excepting below the ghats, can it be termed hot; even in April and May the nights during that season being cool above the ghats, and the monsoon is quite that of Poona. The average fall of rain is about 36 inches, and the only months wherein the forest tracts cannot be safely traversed are for two months after the conclusion of the rains. The Mothoor range of hills, forming a portion of the Sautpooras, affords an excellent retreat for Europeans who might consider that an altitude of some 3,500 feet above the sea would secure to them even a better climate than the district below the hills affords, which nevertheless may be termed decidedly healthy.

J. ASHBURNER,

Deputy Commissioner,

The 1st January 1869. Chindwarra.

P.S.—Subsequent to the framing of this Register in 1866-67, certain modifications have been made in the area of certain villages by the Settlement Department, and consequently the area of some of the plots will be found altered to some extent.

SPECIMEN.

REGISTER of Unreserved Waste Land lots available for sale under the Rules promulgated by the Government of India in General Order No. 158 *of the 7th July* 1863, *or for clearance lease under Chief Commissioner's Book Circular No. XXXVII., dated 4th August* 1866.

No.	Area in Acres.			Boundaries as to adjacent private properties, distance from towns, markets, main-roads, &c.	Description of soil, nature and present condition of its spontaneous forest products, elevation above sea level, salubrity, topography, &c.
	Culturable.	Barren waste.	Total.		
	A. R. P.	A. R. P.	A. R. P.	BHAJEEPANEE.	
1	473 0 0	198 2 0	671 2 0	Bounded on the north by Bhajeepanee; west by Chargaon; south by Bareea and Bajah Deoree, Talooka Adeygaon; and east by Puthree, Maroodkee, and Bhajeepanee. Distant from Chindwarra 48 miles north-east, market of Jhiree 10 miles, Great Indian Peninsula Railway 48 miles, and market of Patun 8 miles.	Elevation, 2,200 feet; topography, hill and dale; natural produce, common jungle wood, and some saj and teak; soil, bunjur burdee; water adjacent.
				CHARGAON.	
2	230 0 0	585 0 0	815 0 0	This chuck is divided into two portions, and is bounded on the north by Dhawye, west and south by Chargaon (from the Malgoozaree area of which this land has been excluded under the Waste Land Rules), and east by Bhajeepanee. The 2nd part is bounded on the north by Sook-	Elevation, 2,200 feet; topography, hilly; natural produce, saj and sagaon scarce, fire-wood abundant; soil, chiefly bunjur burdee; water close to this lot.

				ree, west by Ghogree, south by chuck Thooree Khoord, and east by Mouzah Chargaon. Distant from the town of Chindwarra 47 miles to the north and east. The Police station and market town of Ummerwarra is 17 miles distant. Road to Nursingpore, 17 miles, runs through Ummerwarra. Market is also held at Mouzah Pownar, 12 miles distant. Distance from the railway 48 miles.	
				THAONRU.	
3	138 0 0	531 0 0	669 0 0	Bounded on the north by Mouzah Ghogree, Adehgaon Jagheer; west by Mouzah Joongawanee; and on the south and east by Mouzah Thaonru Khoord (from the Malgoozaree area of which this chuck has been excluded as waste land). Distant from Chindwarra 43 miles north-east. A market is held at Mouzah Patun, distant 11 miles north-east. Police station and market at Ummerwarra distant 14 miles. The road to Nursingpore from Chindwarra runs through the latter place.	Elevation, 2,200 feet above sea level; topography, chiefly hilly; natural produce, chiefly common descriptions of wood; soil, chiefly hilly; a river flows close by.
				BAHRAH.	
4	896 0 0	462 0 0	1358 0 0	This is sub-divided into three parts, and is bounded on the north by Mouzah Chargaon, west by Mouzah Thaonru, and south by Mouzah Bahrah (from the Malgoozaree area of which	Elevation, 2,200 feet above the sea level; topography, chiefly level; natural produce, the more common descriptions

No.	Area in Acres.			Boundaries as to adjacent private properties, distance from towns, markets, main-roads, &c.	Description of soil, nature and present condition of its spontaneous forest products, elevation above sea level, salubrity, topography, &c.
	Culturable.	Barren waste.	Total.		
				BAHRAH—*continued.*	
				this chuck has been excluded under the Waste Land Rules); 2nd part, on the north by Mouzah Chargaon, south and west by Mouzah Bahrah (from which this land has been excluded as waste), and on the east by Mouzah Boree, Adehgaon Jagheer; and 3rd part, on the north by Mouzah Bahrah (from which this land has been excluded as waste), south and west by Mouzah Simmeria, and on the east by Mouzah Boree, Adehgaon Jagheer. Distant from Chindwarra 43 miles north-east. 12 miles from the Police station, market, and town of Ummerwarra, through which the main road from Chindwarra to Nursingpore passes. The market held at Mouzah Pownar is 7 miles distant. The Great Indian Peninsula Railway is 47 miles distant. This chuck has been divided into three parts by reason of the Malgoozaree area of the village lying between its divisions.	of wood, with a sprinkling of saj and teak; a nuddee flows to the north of the chuck; soil, bunjur pahar and retaree.

BOMBAY:
PRINTED AT THE EDUCATION SOCIETY'S PRESS, BYCULLA.